

FACTS AND OBSERVATIONS

RELATIVE TO

CHOLERA,

AS IT HAS RECENTLY PREVAILED IN THE CITY OF YORK.



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FACTS AND OBSERVATIONS

RELATIVE TO

THE DISEASE COMMONLY CALLED

CHOLERA,

AS IT HAS RECENTLY PREVAILED IN THE

CITY OF YORK.

BY J. P. NEEDHAM,

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TO
THOMAS SIMPSON, M.D.,
ONE OF THE PHYSICIANS TO THE YORK DISPENSARY;
AND FORMERLY PRESIDENT OF
THE ROYAL MEDICAL SOCIETY OF EDINBURGH.

MY DEAR SIR,

THERE is no individual to whom I can with so much pleasure or propriety dedicate this Work as to you. The interest you have taken in its progress, and the assistance I have derived, in its execution, from your enlightened conversation, and judicious remarks, demand the expression of my sincere obligation; and I anticipate no greater pleasure on the completion of my labours, than that which I now feel

In subscribing myself, thus publicly,

Your obliged and faithful friend,

J. P. NEEDHAM.

York, December 29th, 1832.



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INTRODUCTION.

THE Author of this Work is fully sensible of his own inadequacy rightly to discharge the duty which he has imposed upon himself, by undertaking to present to the public an authentic account of the Cholera as it has prevailed in this city; and most gladly would he have resigned the task to other and abler hands. But as no other practitioner has expressed a desire or intention to perform, what in the Author's opinion it is imperative on some one to do, both for the interests of the public and of medical science, he has yielded to the recommendation of his friends, and now presents the result of his labours to the candid and enlightened consideration of his professional brethren. Whoever reflects upon the great extent to which the Cholera has prevailed, and probably will continue to prevail, and at the same time bears in mind the suddenness and alarming fatality of its attacks; the

ambiguity of its nature, and, above all, the perplexing contrariety of opinion and practice among medical men as to its treatment; will not be disposed, on slight grounds, to reject any suggestions emanating from competent authorities, nor to condemn the appearance of another Work because so many have been already written on a disease so mysterious and frightful as the Cholera confessedly is. The Author has great pleasure in expressing his obligations to many of the writers who have preceded him upon this subject; and the references which the reader will discover throughout this Work to much of what has appeared in this country, will perhaps satisfy him that no work to which the Author could look for assistance has been passed over without a diligent and careful perusal. With regard to the statements respecting the origin and propagation of the disease in York, the Author assures his readers that they have been obtained from the most authentic sources;—the medical reports received by the Board of Health, and conversations with respected professional friends. To prevent misapprehension, it may perhaps be as well to say, in limine, that the Author does not come forward with any “nostrum” or pretended “specific” for the cure of Cholera. He knows of no infallible remedy, and fears that none will ever be discovered. The most that can

be hoped for, will probably be found after a careful and deliberate reflection on the comparative results of different modes of treatment, and legitimate deductions from them. But unless science should hereafter furnish us with remedies of greater power, and of different operation, from any which we are now acquainted with, it appears to the Author that we must rest satisfied with testing the different remedies which we now possess; and by a strict estimate of their respective value, select from them those which experience proves to be most worthy of our reliance and confidence. The Circulars recently issued by the Central Board in London, requesting medical men to state the results of their practice in the three stages of the disease, will, it is to be hoped, elicit a great mass of practical information, which may form a basis upon which to build a more efficacious and rational system of treatment, than any which has yet been generally adopted. To this end it is also extremely desirable that the practitioners, in every place visited by the Cholera, would so arrange amongst themselves that at least one authentic and comprehensive treatise might be laid before the public, embodying a detailed account of every thing connected with the history and treatment of the disease: and perhaps the plan adopted in Edinburgh, of dividing the labour, and ensuring the co-operation

of a number of able and scientific men, might afford an useful model for such arrangements.* It will be found, in the following pages, that much importance has been attached to the question of contagion, and that a variety of reasonings and facts have been adduced in order to confirm the affirmative doctrine. Indeed, the Author is bound, by all that he has read and witnessed of the disease, to declare his full and entire conviction that the Cholera is propagated by contagion, and by that means alone.† What influence he believes the various conditions of the atmosphere exercise over its propagation is fairly and impartially stated, according to the best of his knowledge. It was the intention of the Author to have made some reflections upon the prophylactic measures to be adopted against this disease, and upon the constitution and conduct of Boards of Health; but the other parts of the work have occupied so much more time and space than was at first contemplated, that he has been obliged to omit them. One very evident imperfection in the con-

* Vide Supplement to the Edinburgh Medical and Surgical Journal, February, 1832. Pp. 277 et seq.

† The terms contagion, human effluvium, and infection, are used synonymously; and whenever the term epidemic is adopted, the Author wishes it to be understood that he does not attach any other meaning to it, than the extensive prevalence of the disease, considering it, in all cases, contagious.

stitution of Boards, however, ought not to be passed over in silence: it is this, that in the majority of small towns where the Cholera has prevailed, a selection only has been made, and that oftentimes not the wisest, from the resident practitioners, as members of their respective Boards of Health. This evil, though apparently a trivial one, has probably given rise to a good deal of bad feeling, and prevented that cordial and unanimous co-operation in the profession, which is so highly desirable, as well for the adoption of preventive regulations, as for the interests and security of the public generally. From what has occurred in this city, as well as in some other towns, the author has no hesitation in recommending to the profession, and especially to those members of it who may not have had experience in the disease, the necessity and perfect fairness of insisting upon remuneration for their services to the poor. No person can form any adequate idea of the great labour and difficulty imposed upon medical men where the disease prevails extensively, unless he has had experience of it; and to incur all this toil and risk gratuitously, merely to prevent expense to parishes, is so inconsistent with right, and the practice of every other profession, that it ought to be no longer borne with. The Clergyman will not resign his fees, nor the tradesman

his profits; but the medical men are too often considered as having no claim to the former, and no just interest in the latter. They are made the servants of the public, and in return do not receive even the gratitude of that selfish tribunal. Votes of thanks are indeed profusely lavished, for they cost nothing; but the just and reasonable claims of the profession are met by nothing but outcries of illiberality and selfishness. *Verbum sapientibus sat est.*

FACTS AND OBSERVATIONS, &c.

CHAPTER I.

NOSOLOGICAL ARRANGEMENT OF THE DISEASE—DEFINITION
—SYMPTOMS: FIRST STAGE; SECOND, OR CHOLERIC
STAGE; THIRD, OR FEBRILE STAGE.

THERE can be little doubt that the term *Cholera*, usually employed to designate the disease which is the subject of the following observations, has exercised a very pernicious influence over the minds of the medical men of India, and of this country. It has not only caused its history to be confounded with that of the Cholera Morbus, which from time immemorial has ravaged the Indian continent; but it has given rise to the employment of a system of treatment, the very reverse of that which a more appropriate designation of the malady would have suggested. Whether the adoption of other and entirely different remedial agents would have been attended with greater success, is another question, and does not materially affect the statement just made. The objection to the term *Cholera* is not new: it has been urged and provided against by Dr. James Johnson,* who prefers the term "*Choleric fever*," which has also been adopted by Dr. Brown, of Sunderland, in his able and luminous article in

* See Medico-Chirurg. Rev., Vol. XVI. New Series, p. 274.

the Cyclopædia of Practical Medicine.* The observations of this experienced Physician are so much to the purpose, and so entirely coincide with our own opinion, that we shall take the liberty of transcribing them. "If we consider that the Choleric symptoms, if not fatal, prove but the commencement of a series of changes, to which any one who witnessed them alone would give the appellation of fever, and which men of great experience in the disease have declared they could not distinguish from typhus: if we observe, too, that long before this epidemic excited attention, symptoms, strikingly resembling those of Cholera, had been observed to form the initiatory stage of certain malignant fevers,† we are disposed to admit that it is in reality a fever, and that to designate it merely Cholera is to take a part for the whole, and to give to the inexperienced, as far as a name can give it, an erroneous idea of the disease. At the same time it would be advisable to mark its relation, a relation which it unquestionably possesses, to the disease from which it is dissociated, and to apply to it the trivial epithet, Choleric."

Dr. Brown then gives the following definition of the disease:—"After watery diarrhœa, or other generally slight indisposition, vomiting or purging of a white or colourless fluid, violent cramps, great prostration and collapse,‡ the last occurring simultaneously with the vomiting and cramps, or shortly after them. Should the patient survive the last train of

* Vol. I. Art. Cholera, p. 387.

† "For further information on this point, consult Dr. Negri's Letter to Dr. Barry; Morton, Pyretologia, pp. 16, 33, 81; Torti de febris, Lib. III. cap. 1. p. 124; and Med. Essays, by J. Brown, M.D. pp. 37, 39."

‡ "By *collapse*, in this definition, is meant the feebleness, or almost the arrest of the circulation; the death-like appearance, the

symptoms, a state of excitement and fever supervenes." Indeed, so near is the resemblance in some cases between the consecutive fever and the ordinary contagious fever of this country, and in others between it and severe typhus fever, that it becomes almost impossible to recognise the disease in that stage, as the prevailing epidemic. This was well illustrated by the first case that occurred in this city. The patient, Thomas Hughes, was attacked on Saturday, the 2d of June, and was visited by Mr. Wilson, the very meritorious Apothecary to the Dispensary, who immediately suspected the true nature of the disease, and very properly requested one of the Physicians to see the case with him. We are informed that the symptoms were characteristic and undoubted; but on visiting the man on Monday afternoon, we found him labouring under the consecutive fever, and in answer to a question from another medical gentleman who was also present, we replied that we were quite unable to identify the disease as Cholera, remarking that it bore more analogy to common fever, produced by cold, in a person of weak and impaired constitution. The previous history of the case, however, and the subsequent extensive prevalence of the disease in the same part of the city, put the matter beyond all reasonable doubt. It must not, however, be inferred, that the febrile stage of Cholera

coldness, shrinking, and occasional blueness of the surface, which may in other diseases be observed after they have existed some time, and as the powers of life are passing away; but which occur in what we shall call the cold or choleric stage of the epidemic, in a short time after its commencement, as though they formed an essential part of it. The degree and early accession of this collapse, and the white discharges, are the only distinctive marks, that we are aware of, between this stage of the epidemic and ordinary Cholera."

is always so analogous to the more common forms of fever, as to be in all cases impossible of discrimination. On the contrary, we fully concur in the following remarks by Dr. Brown, that "there is a certain form of the febrile stage, which supervenes on the choleric (or cold) stage, attended with extreme collapse, which the deficiency of the temperature and the circulation, the congested state of the conjunctiva from the very commencement of the fever, and the peculiar torpor of the intellect, would enable, as it appears to us, the observer to discriminate from any fever which we are in the habit of witnessing in this country, *provided he saw the patient early, and watched him throughout*; but in the majority of instances the diagnosis can only be correctly drawn by coupling the preceding history of the case with the existence of fever and with its character." We have thus shown that powerful arguments may be adduced, to render it extremely questionable that this disease does in reality belong to the genus Cholera, and at least to suggest the probability, that it is much more nearly related to that of fever. As, however, the term Cholera is in general use, and has been sanctioned by eminent authorities, it will be retained in the present work; premising, however, for reasons already adduced, that the disease must be considered as truly and essentially a *fever*. We shall now proceed to the consideration of the symptoms, arranging them as they occur in and characterize the three stages of the disease. Though these have been so often reported, and are now so well and universally known to practitioners, it would be censurable, as an omission, were we not to give a detail of what has occurred to our own observation

in a pretty extensive practice among patients affected with Cholera.

One of the most general premonitory symptoms is, undoubtedly, diarrhœa, of greater or less severity in different persons, but hardly ever, we believe, entirely absent for some time before any other feeling of indisposition is noticed. We have frequently been informed by patients, of its continuance for several days, in some cases for more than a week, before they have experienced any other symptom of sufficient moment to induce them to seek advice; and we cannot but consider the general neglect of this first and warning symptom, as one of the chief causes of the great fatality of the disease. On the other hand, sometimes the diarrhœa is so very profuse, and rapidly produces so great a disposition to collapse, that only a comparatively short interval has been observed between its first occurrence and the more marked and alarming symptoms of the disease. We remember a few cases in which the period must have been very short; but they were extreme cases, and such as do not generally occur, at least, in this country. One of these was the following:—A strong, powerful, and active woman, aged 50, retired to bed, in perfect health: she had sustained no previous evacuation, and was observed about eleven o'clock to be in excellent health and spirits. She was attacked with purging and vomiting to a profuse degree, and after filling the chamber-vessels, left her room, and went down stairs into a wash-house, for the purpose, it was imagined, of quenching her thirst with cold water. She was discovered lying on the floor, about one A. M., cold and collapsed; her pulse imperceptible; breathing laborious; eye-lids half-closed; and her skin much

discoloured, and bedewed with a profuse cold perspiration. She was removed in that state to the Cholera Hospital, where she died the same morning, about fourteen hours after her attack. A case, somewhat similar to the one just related, occurred to us a short time afterwards. A woman, about 60, active and healthy, ate her dinner, as usual, between twelve and one o'clock, and with very considerable appetite. She had not partaken of any thing likely to disturb the stomach or bowels. About two o'clock, P. M., she was purged, the only evacuation she had had for three days. The diarrhœa increased, and became copious and watery; cramps in the toes and legs succeeded; and we were requested to visit her about half-past three. She was in the act of vomiting, for the first time, as we entered her chamber: her appearance was much altered from health; her voice had become slightly husky, and her pulse quick and feeble. She rapidly became collapsed, and died about seven o'clock the next morning. It is in such cases as the above, that no combination of remedies yet discovered seems to be at all availing. But, fortunately, such is not the usual course of the disease, otherwise every patient attacked by it must inevitably perish. After a longer or shorter continuance of the purging, attended, perhaps, with griping pains in the bowels, and a sense of stricture and sharp pain across the epigastrium, the stomach becomes affected with nausea, and a disposition to vomiting. There is some degree of dizziness and pain in the head, with a feeling of great general weakness. Cramps, if they should not have been experienced sooner, now affect the fingers, toes, or calves of the legs, and after subsiding for a short time, again recur, perhaps in different parts of the body, and produce greater suf-

fering and alarm. The evacuations are now decidedly watery, and assume the appearance of rice-water, so characteristic of this disease. The pulse may be full and rather bounding, and beating a hundred or more in a minute; or it may be slower, oppressed, and feeble. This constitutes the first stage of the disease; and it is now that remedies may be administered with considerable prospect of success: but frequently, in spite of every attention, and most unexpectedly, cases in which the symptoms are not more threatening than those just described, will suddenly evince a very alarming tendency, and in a short period assume all the characters of the most hopeless and irremediable collapse. The temperature of the body rapidly declines, especially on parts exposed to the air, which feel colder than natural, and become covered with a copious perspiration, or cuticular exudation. The pulse at the wrist is small, and extremely feeble, or altogether imperceptible; and the heart and larger arteries are discovered to be beating with interruption and effort. The tongue is moist, white, and cool, or perhaps so cold as to justify the comparison of dead flesh; and the breath, instead of feeling warm, produces the sensation of a current of cold air; respiration is short and hurried, and performed with difficulty; the purging is frequent, copious, and involuntary, giving little pain, and indeed hardly exciting the patient's attention, who seems to be overpowered with sinking and anxiety; the vomiting is frequent and excessive, sometimes alternating with half-stifled efforts at retching; the contents of the stomach are ejected with force, as from a syringe, or imperfectly, and with considerable difficulty. The patient complains, perhaps, of ringing in the ears, or of noises like the beating of a drum: and if spoken to in a moderate tone of voice,

gives no heed to your questions, as though deaf, or of difficult hearing. He tosses about wildly and incessantly, calling out for the cold air, or cold drink; or lies quiet, apparently devoid of sensibility; or if he manifest consciousness, it is but to complain of the severity of the cramps, and to solicit that the parts may be rubbed. He seems to have lost all natural affection; he asks neither for wife nor children; nor does the thought of leaving them appear to disturb the almost lethargy of his soul. His mind is, however, rational, for he can answer discreetly and properly; though only in "a whisper of mingled huskiness and feebleness." The hands are corrugated and sodden, the fingers blue, or blackish, and affected with clonic spasms; the countenance is sunken and death-like; the eyes are hollow and ghastly, and surrounded by a dark areola; the conjunctivæ are already injected, and the eye-lids half-closed; the nose is pinched and sharp, and the whole face presents the picture of death. No urine is secreted, and towards the end of this stage of the disease, or at its full development, all the secretions are arrested, and the evacuations probably cease entirely. This constitutes the second stage, or stage of collapse.

Now this is the stage of the disease which is by far the most alarming, and the most frequently fatal; and we have not in our own experience met with one instance in which the *unaided* powers of the system have seemed at all adequate to any effort at recovery. We are aware that this is opposed to the experience of a few practitioners in other places; but we are confident, that in an immense majority of instances it has been found, that when collapse has been complete, the powers of life have sustained such great and overwhelming depression, as to have been ren-

dered entirely incapable of any thing worthy the name of re-action. Dr. Brown, of Sunderland, "has seen more than one patient emerge from it (the choleric, or cold stage) by the powers of the constitution; to have a faint chance for life, in a very bad form of fever, after all the efforts of art had proved ineffectual for bringing on re-action. He has seen this apparently spontaneous transition into the febrile stage, take place after the patient had remained for many hours without any perceptible pulse at the extremities."

In opposition to this statement, we will adduce the following from the Medical Gazette :* "In Tullamore, where, according to the latest accounts, the Cholera has carried off above two hundred already, *there has not been a single case of recovery.*" And we remember a similar statement is somewhere to be found, but the reference to which we have mislaid, in the reports of the disease in India. Medical assistance was not procurable, and every person attacked by the disease fell a victim to it. But though we have not witnessed a single instance of complete collapse passing into the febrile stage, by the unassisted powers of life, and are, consequently, obliged to assign considerable importance to judicious medical treatment, it is not our intention to eulogize very highly the powers of any single remedy, or any combination of remedies, over this stage. On the contrary, we are fully convinced that our remedial measures are very far from being satisfactory, and that this stage of the disease is that over which we have the least control, and of which the indications of cure are the most contradictory, and the least understood.

* Vol. X., p. 401.

We cannot, however, assent to the proposition of Mr. French: * “That in some instances, the disease continues its progress till the death of the patient; but, in the very large majority of cases, when left to nature, the disease ceases when it has produced a state of collapse, varying in intensity.” Under such circumstances it will almost certainly *cease in death*, but not in recovery to health.

We shall now proceed to the consideration of the third, or febrile stage; prefacing our own observations with the graphic accounts of it by Drs. Russell and Barry, and Keir. The former gentlemen observe, “After the blue cold period has lasted from twelve to twenty-four, seldom to forty-eight hours or upwards, the pulse and external heat begin gradually to return, head-ache is complained of, with noise in the ears, the tongue becomes more loaded, redder at the tip and edges, and also drier. High coloured urine is passed with pain, and in small quantities; the pupil is often dilated; soreness is felt on pressure over the liver, stomach, and belly; bleeding by the lancet or leeches is required; ice to the head gives great relief. In short, the patient is now labouring under a continued fever, not to be distinguished from ordinary fever. A profuse critical perspiration may come on, from the second or third day, and leave the sufferer convalescent: but much more frequently the quickness of pulse and heat of the skin continue; the tongue becomes brown and parched; the eyes are suffused and drowsy; there is a dull flush, with stupor and heaviness, about the countenance, much resembling typhus; dark sordes collect about the lips and teeth; sometimes the patient is pale, squalid,

* Med. Gaz. Vol. X., p. 828.

and low, with the pulse and heat below natural; but with the typhous stupor delirium supervenes, and death takes place from the fourth to the eighth day, or even later; in the very individual, too, whom the most assiduous attention had barely saved in the first or cold stage. To give a notion of the importance and danger of the Cholera fever, a most intelligent Physician, Dr. Reimer, of the Merchants' Hospital, informs us, "that of twenty cases treated under his own eye, who fell victims to the disease, seven died in the cold stage, and thirteen in the consecutive fever." *

The following is Dr. Keir's account of it:—"Much more frequently, however, a second ordeal now begins, sometimes as severe, and frequently not less fatal, though more slowly so, than the first: this is probably the effect of the morbid changes which have been induced during the first period of the disease. The appearance of the complaint is now entirely changed, insomuch that one who had not seen the patient during the first period, or been told of the symptoms, could not possibly know that he was suffering from the epidemic. I have observed the disease in this, its second period, to assume four forms: the first, an inflammatory, or rather, sub-inflammatory state of the stomach and bowels, most frequently the latter, sometimes conjoined: the second, inflammatory irritation of the lungs, with pain of the chest, cough, viscid expectoration, and fever, appearing as a critical metastasis of the disease: the third, bilious, or bilio-nervous fever, with suppuration of the parotid glands; in one case, with axillary suppurat-

* Papers relative to Chol. Spas., published by authority of the Privy Council. P. 38.

ing bubo, towards the end of the fever, an inflammatory irritation of the lungs took place, ending in vomica: and the fourth, a congestive sub-inflammatory state of the brain and spinal chord. This last, as was natural to expect from the nature and seat of the affection, proved by far the most dangerous and most frequently fatal form of the second period. It appeared generally to supervene after the purging, vomiting, and cramps had been relieved, and the external heat in some degree restored; the patient complained of pain in the back, between the shoulder-blades, or in some other part of the spine,—sometimes along its whole tract. He appeared sleepy to such a degree, that at first I was disposed to attribute this state, in part, at least, to the effects of the opium given in the first period; but I was soon convinced that the cause of this symptom, and of another strongly characteristic of this form of the disease, namely, the filling of the vessels of the sclerotica with red blood, was a congestive, sub-inflammatory state of the brain and spinal chord. This striking symptom at first began to show itself in the inferior part of the globe of the eyes: it gradually increased, and, little by little, reached the upper part, while the eyes turned upwards, exposing the lower part, gorged with blood. This state of the patient generally ended in a complete coma, and proved fatal a few hours afterwards.” *

The above observations were made during the prevalence of the disease in various parts of Russia, and are amply confirmed by the accounts already published in this country. Though this secondary fever does not appear from the “Reports” to have

* Papers, &c., printed by order of the Privy Council. Pp. 12, 13.

been so generally observed in India as on the continent of Europe, still there are sufficient instances to be collected from all the Indian reports, that fever was by no means a very unusual occurrence, though it seems to have partaken more of the inflammatory and bilious character, and less of the typhoid, than in Russia and this country. But, if any important modifications of the disease have taken place since it extended its ravages to Europe, we should be inclined to characterize them by the general occurrence of consecutive fever, and the absence of those sudden and instantaneous attacks of collapse, so frequently reported in India, or in other words, the almost uniform existence of premonitory symptoms.

Though we can add very little to the accounts already given by Drs. Russell and Barry, and Keir, of the consecutive fever, yet in order to render our narrative complete, it will be necessary to describe its character as presented to us in this city. We have not observed any instance of decided collapse continuing more than forty-eight hours, in which the patient has emerged from it into this, the third stage. Always before that time, if the case should not have terminated fatally in the cold stage, symptoms of slight re-action have presented themselves, affording a hope that the patient's recovery might possibly be ensured by assiduous attention to his personal comforts and medical treatment. The pulse is observed to rise feebly and slowly, the temperature of the skin gradually becoming higher, sometimes, indeed, so rapidly as to excite great surprise; but generally very slowly, and requiring the utmost care to maintain external warmth, for were any part of the patient's body exposed for even a very short time to the air, its temperature would sensibly fall; the tongue feels

warmer, and in favourable cases, is moist, but always coated with a thick white or brownish fur; in bad cases, it is dry, chopped, and red or blackish; the teeth are almost always covered with sordes, the countenance is flushed and exceedingly dull, and regains its animation very gradually, especially if the patient be not roused by conversation, when a momentary gleam appears to be recalled to his torpid features; he lays apparently almost comatose, or complains of pain in the head, chest, or belly, and there is usually considerable difficulty in breathing; the eye-lids are half closed, and the sclerotica is seen to be highly vascular and congested; the evacuations from the stomach and bowels have probably ceased, or nearly so, for some hours previously, and do not now recur, or if they should, they seldom fail to produce considerable sinking and depression; the cramps have ceased entirely; the urine is at first scanty and high-coloured, afterwards pale and more copious, but sometimes several days will elapse without any urine at all being secreted, and this occurs most frequently, we think, when the brain is the organ principally affected. Delirium is not of infrequent occurrence, and sometimes it is accompanied with so much restlessness, as to render it difficult to keep the patient covered, or even to detain him in bed; but with all this apparent excitement, the pulse continues to be feeble, and comparatively slow, and the temperature of the surface is remarkably deficient. We have known this consecutive fever to continue eight days, and afterwards prove fatal; but it has not occurred to us to witness a death in this stage of the disease, after the period just specified: at the same time, however, we are bound to confess that most of the cases under our observation have proved fatal before that period.

The symptoms which we have had most difficulty in combating, have been those arising from affection of the brain, and the continued suspension of the urinary secretion.

Although the indications of cure are less ambiguous in the febrile than in the collapsed stage, and perhaps more frequently successful, there are nevertheless great difficulties to contend against before a bad case of this fever can be brought to a happy termination. The powers of life are so extremely feeble, and so incapable of bearing further copious evacuations, whilst the sub-inflammatory and congested state of many of the most important organs is so urgent as absolutely to require depletory measures, that we know of no cases demanding the combined exercise of greater caution, promptness, and judgment on the part of the practitioner.

CHAPTER II.

PROGNOSIS—DIAGNOSIS—PATHOLOGY OF THE DISEASE—
POST-MORTEM APPEARANCES.

It is often quite impossible to pronounce from the symptoms of the first stage, whether the disease may be completely arrested by judicious treatment, or whether in spite of it, it will rapidly progress into the second, or collapsed stage; though there can be no doubt that a very great majority of cases may be easily controlled by the proper means. At the same time, many cases have presented themselves, in which the patients, though young, and not greatly reduced by the disease, have, on sustaining a copious evacuation, rapidly fallen into collapse; while, on the other hand, instances have occurred of old persons who have sustained great evacuations of a watery character for two or three days, being immediately relieved by the very same means which in the former cases had completely failed.

But the degree of danger is always to be measured by that of the collapse. Should this last be fully formed, and the sufferer be weakened by previous dissipation, old age, or other well known causes, the certainty is, that he will either immediately sink, or pass into a bad form of consecutive fever, not less dangerous. Though we have always observed severe collapse to be succeeded by a proportionate degree of fever, yet we have also seen a high degree of fever succeed to comparatively slight collapse; though in these cases

it has partaken more of an active, inflammatory character, and been more perfectly under the control of remedies. Great irritability of stomach, indicated by violent and long continued vomiting, is always to be much dreaded; for it not only prevents the operation of remedies, but seems in a very remarkable manner to depress the powers of life. The most rapid cases of collapse have been those in which, *cæteris paribus*, the stomach has manifested the greatest irritability.

Diagnosis.—It is hardly possible for a person conversant with the character of this disease, to mistake a well marked case of it, for any other that we are in the habit of witnessing in this country. The peculiar character of the evacuations, the early accession of collapse, and the consecutive fever, are sufficiently diagnostic of it. But it may, nevertheless, in the early stage, be a matter of great difficulty to say positively whether the case be one of genuine Indian Cholera, or merely of the common Cholera Morbus; and the difficulty would be much increased if it occurred at a time of the year when the ordinary Cholera might be expected, or was known to prevail. In such a case, we do not think the nature of the evacuations alone would furnish a test of sufficient accuracy; for we have seen the malignant disease commence with *bilious* purging and vomiting, which have even continued till within a very short period of the accession of severe collapse; and, on the other hand, it has been shown by Dr. James Johnson, in his “Treatise on Derangements of the Liver, Internal Organs, and Nervous System,” that in the Cholera Morbus of this country, the evacuations are at first *thin* and *watery*, and do not become *bilious* till after a period of, perhaps, several hours. As we think the subject important, and deserving of more attention than it has hitherto

obtained from medical men generally, we shall subjoin a pretty copious extract from Dr. Johnson's work :

" From the days of Hippocrates, down to those of Saunders, Cholera has been considered dependent on a redundant secretion of bile. To this conclusion they have evidently been led, by keeping an eye rather on effects than on causes. They have totally passed over the several links in the morbid chain preceding the discharge of bile, and thereby confounded a salutary effect with a proximate cause. Now, I conceive that a close examination of the phenomena or symptomatology of the disease, will not bear out this generally received doctrine. Sydenham, that accurate observer of nature, has drawn a faithful portrait of Cholera Morbus, which may serve as a standard description. It is adopted in Rees's Cyclopædia.

" The attack of this complaint, say they, is generally sudden. The bowels are seized with griping pains, and the stools, which are at first *thin and watery*, as in common diarrhœa, are passed frequently. The stomach is seized with sickness, discharges its contents, and rejects what is swallowed. In the *course of a few hours* the matter vomited, as well as that which is discharged by stool, appears to be *pure bile*, and passes off both ways, in considerable quantities. The griping pains of the intestines *now* become more severe, in consequence of the extraordinary irritation of the passing bile, which excites them to partial and irregular spasmodic contractions. These spasms are often communicated to the abdominal muscles, and to the muscles of the lower extremities. The stomach is also affected with considerable pain, and a sense of great heat, in consequence of the same irritation. There is usually great thirst, and sometimes a severe head-ache, from the sympathy of the head with

the stomach. The pulse becomes small and frequent, and the heat of the skin is increased. A great degree of languor, debility, and faintness, amounting sometimes to syncope, speedily comes on; sometimes attended with colliquative sweats, coldness of the extremities, and other symptoms, which often destroy the patient in twenty-four hours.

“ Now, when we reflect on this description of Cholera Morbus, which is a very correct one, we cannot but wonder why an increased secretion of bile should have been so universally set down as the cause of the disease, when it is allowed that we see nothing of it, till after the complaint has made some progress. Where is this redundancy of bile all this time? It is not in the stomach; for it discharges its contents, and rejects what is swallowed, long before. It is not in the intestines; for, as Sydenham well observed, the stools are, at first, thin and watery. At length, however, some bile appears, and it is accused of being the cause of all the mischief.

“ It is agreed upon by all, that Cholera Morbus is most frequent, in this country, during the months of August and September; a season of the year when the evenings begin to get cool, although the days are still hot. It is also worthy of notice, and it did not escape the observation of Sydenham, that both in hot climates and in the hot seasons of mild climates, occasional falls of rain have been particularly followed by an epidemic Cholera. This circumstance is surely very little explanatory of superabundance of bile; but it tends to elucidate and confirm the pathology of the disease, which we shall presently have occasion to enter upon. It tends to the same point too, that heat has been allowed by many to be the *predisposing* cause of the disease, while certain

ingesta, and *sudden changes of temperature*, are proved to have excited the predisposition into action. Indeed, the late Dr. Saunders, who supports the doctrine of increased secretion of bile being the original cause of Cholera, expressly acknowledges that the disease is often brought on by drinking cold liquors, or by any thing else that suddenly chills the body, especially when overheated by exercise or labour.

* * * * * I may also add, that Dr. Armstrong and Dr. Ayre have come to the same conclusion, which I have come to; namely, that the excessive secretion of bile in Cholera Morbus only takes place in the second stage of the disease, or period of reaction, and that its appearance *then* is a sanative effort of the constitution. Dr. Watt, of Glasgow, too, has come to nearly the same pathological opinion.*"

The above quotation, though long, will perhaps be excused, considering that it is not altogether foreign to this branch of our subject, and because we have met with many practitioners who have neither seen Dr. Johnson's observations, nor made the same themselves. But although it may not be easy, in all cases, to make a very positive diagnosis during the first symptoms of Cholera, it is fortunately of very little practical importance, as, according to our experience, the same means will be proper for both diseases. We have never experienced the least doubt or difficulty in recognising the cold or choleric stage, nor do we conceive that any difficulty can possibly be felt in future. The third, or febrile stage, is undoubtedly more likely to be confounded with other forms of fever already familiar to us, if we dissociate it from the history of the preceding symptoms, or if a knowledge of these could not be clearly obtained, but this is hardly likely to occur; and as we have already

* Pp. 49, 50, 51. Third Ed. 1820.

enumerated the marks by which the Cholera fever may be usually discriminated, it will not be necessary now to detain the reader by a repetition of them.

Pathology of the Disease.—The diversity and discordance of opinion entertained by medical men of great talents and ingenuity, respecting the true nature and priority of those functional or organic lesions on which the phenomena of Cholera have been supposed to depend, have hitherto been so great, and each has been advocated with so much plausibility of argument, and supported by such striking analogies, that it becomes a task of some difficulty to assign to each its relative importance, and to deduce from them all one consistent and comprehensive theory, which, if not clearly applicable to every case, may still be so in a very great majority of instances. One cause of the great diversity of opinion regarding the true nature of Cholera, is doubtless to be found in the different characters assumed by the disease in different places, and in different persons. Thus, in India, where the premonitory symptoms have often been wanting, and the patient has appeared to be struck with death in an instant, as it were, we find the brain and nervous system referred to as the organs first affected, and the whole catenation of symptoms assigned to deprivation of the nervous energy.* Others, again, having observed that the functions of the brain, instead of being much disturbed at an early period of the disease, retain a considerable degree of activity long after the functions of organic life have nearly ceased, assume that the ganglionic system of nerves are the organs first implicated, and deduce all the phenomena of the disease from a failure of the functions of respiration, circulation, se-

* For some ingenious illustrations of this doctrine, see Orton's Essay on Cholera, p. 56 to 111, inclusive.

cretion, assimilation, &c., consequent on the lesions of that system of organs;* and there can be little doubt that many of the most fatal symptoms are truly referrible to that source. But whether we can fairly attribute the earlier symptoms, those of the first stage, to that source, as the primary and efficient one, may admit of considerable doubt. For although it has been proved, by post-mortem examination, that parts of the ganglionic system of nerves are sometimes inflamed, softened, or otherwise altered, in consequence, perhaps, of inflammation, it is far from being generally the case; and it still remains to be demonstrated that those alterations of structure may not depend on sympathetic morbid actions, rather than on original and idiopathic affections of the nerves themselves.

But other persons, claiming the character of physiologists, have contented themselves with a much less comprehensive analytic inquiry, and have discovered in the interruption of the functions of some one important organ, which could not be expected on either of the above-mentioned hypotheses to retain its integrity, an adequate and sufficient cause of all the other phenomena of the disease. Thus, we find the essence of Cholera to consist in paralysis of the lungs, heart, kidneys, liver, &c., &c.; the advocates of these respective opinions forgetting, that long before any one of these organs becomes sensibly affected, other symptoms, equally characteristic of the disease, have not only existed, perhaps for a considerable time, but become the cause of well-grounded alarm both to patient and physician. Besides which, it may be safely asserted, that, admitting for the sake of concession, that the condition specified of any of the

* See Mr. G. H. Bell's Treatise on Cholera Asphyxia.

organs last mentioned really exists, it has not been shown how the other phenomena can be justly and philosophically deduced from that one source, nor how the purging, vomiting, and cramps are to be accounted for, before the condition on which they are assumed to depend can be discovered to be really present, or imagined to have any proper existence. Another still more plausible theory, and one which it may be difficult in the present state of our knowledge altogether to controvert, would point out some morbid state of the blood, existing before any of the symptoms deemed characteristic have presented themselves to notice, as the first link in the chain of phenomena; and that, indeed, on which all the others are supposed to depend, and from which they originate.

Dr. Stevens, in a late number of the Medical Gazette, has attempted to show that the blood of healthy persons exposed to the emanations from the bodies of the sick, is at least different in colour, if not otherwise diseased, from that of other healthy persons not so exposed; and seems to infer that some such changes might always be discovered, while as yet no other indication of the disease is observable. To this we can only reply, that the experiments are by far too few to warrant the assumption that such conditions of the blood are constantly and universally antecedent. We know that many causes are in operation to effect a change in the colour of the blood, even in health, and it is not improbable, *cæteris paribus*, that in blood taken from different persons, some difference in colour, or other physical characters, might always be recognised; at least, we are sure that such is the case in very trifling deviations from perfect health. But in ordinary cases, and especially when the alteration from its normal state is not great, we attach little or no importance to such appearances, because

their influence on the system at large is scarcely appreciable, and because they may depend on change of food, active or sedentary habits, and a great variety of other causes. But when the disease has become fully developed, and particularly in the cold, or choleric stage, the state of the blood and sanguiferous system is doubtless very remarkable; but still the question reverts, Does this condition of the blood occur, *ab origine*, as the cause of all the other phenomena, or may it not depend on that partial arrest of the heart's power and action, consequent on sympathy with the irritation already existent in other organs of the body? In one very remarkable case in which we bled the patient just before she went into the stage of collapse, we could discover no other sensible deviation from the ordinary healthy appearance of the blood, than that of its slightly buffy coat, which, in all probability, depended on the condition of pregnancy in which the patient was at the time of her seizure and rapid death. This statement is also confirmed by Mr. Scott, who states in his Report, "that the change in the blood is likewise fully proved to be in the ratio of the duration of the disease; the blood at the commencement seeming to be nearly or altogether natural, and more or less rapidly assuming a morbid state as the disease advances. Some very rare cases are recorded where, however, this morbid state of the blood was not observable, although the disease had been for some time established; and instances have occurred when the blood flowed readily, sometimes little altered, where nevertheless death ultimately ensued." Although, therefore, we do not attach much importance to a morbid quality of the blood, as the proximate cause of Cholera, we are glad that investigations of its properties have been made; and think the results already obtained, not only in-

teresting in a philosophical appreciation of symptoms, but that they may possibly be productive of some practical good as indications of more successful treatment. For further information on this subject, we have much pleasure in referring the reader to an able and excellent "Report" by Dr. O'Shaughnessy, from whose work the following table is extracted.*

COMPARATIVE ANALYSIS OF SERUM IN HEALTH, MALIGNANT CHOLERA, AND BILIOUS DIARRHŒA.

Ingredients.	Healthy Standard of Lecanu.	Malignant Cholera. Mrs. Barras.	Bilious Diarrhœa. Mr. Hawthorn.	Malignant Cholera. Dewar.	Remarks.
	0.	1.	2.	3.	
Water	906.00	854.00	921.75	866.80	
Albumen	78.00	133.00	61.85	124.0	
Urea	0.00	0.40	0.00	0.00	
Organic Matter soluble in Alcohol and Water	1.69	*4.80	*5.20	*4.00	*Embrace the Organic Matter, and Albumen of Soda.
Albumen combined with Soda ..	2.10				
Fatty Matter:					
Crystalline	1.20	} 1.40	1.90	1.23	
Oily	1.0				
Muriate Soda	} 6.00	4.00	5.00	2.17	
Muriate Potassa ..					
Carbonate of Soda	} 2.10	0.00	2.30	0.5	
Phosphate of Soda					
Sulphate of Soda					
Carb. Lime	} 0.91	1.60	1.10	0.70	
Carb. Magnesia ..					
Phosp. Lime					
Phosp. Magnesia					
Phosp. Iron					
Loss	1.00	0.60	0.90	1.5	
Total	1000.00	1000.00	1000.00	1000.00	

* Report on the Chemical Pathology of the Malignant Cholera. 8vo., 1832.

The results of Dr. O'Shaughnessy's experiments are thus stated by himself: "The summary of my experiments may therefore be described as denoting a great but variable deficiency of water in the blood in four malignant Cholera cases; a total absence of carbonate of soda in two; its occurrence in an almost infinitesimally small proportion in one; and a remarkable diminution of the other saline ingredients. Again, in the dejections passed by one of the patients whose blood was analyzed, we find preponderance of alkali, and we recover the other saline matters deficient in the blood. Lastly, the microscopic structure of the blood, and its capability of aëration, are shown to be preserved."

Enough has now been said to show, not only that great difference of opinion has prevailed respecting the real nature of Cholera, but also that it is a subject, confessedly, of great difficulty; and we much fear that in the present state of our knowledge, no theory that may be advanced will be found adequate to account clearly for all the phenomena, or be deemed of sufficient truth to be generally and unhesitatingly adopted. It is certainly not with any hope of bringing about such a "devoutly to be wished for consummation," that we advance any opinion upon the subject. We think, however, that no person can have reflected much upon the phenomena of this disease, as they have generally occurred in this country, without attaching very great importance to the affection of the stomach and bowels, so often observed to be the first symptom of the disease, and sometimes continuing for several days before the more formidable and characteristic appearances have presented themselves, though, if neglected, not the less certainly to be followed by them. If any symptoms can be considered as generally primary, there can be

no doubt that those resulting from disorder of the stomach and bowels ought to be considered so; for we have seen the commencement of no case, either of mild or malignant Cholera, in which they were absent, when other sufficiently characteristic symptoms were present. Indeed, the mild cases consist in little more than purging, associated, perhaps, with nausea, or occasional slight vomiting, cramps, or dizziness in the head. It is in the latter, or malignant kind of cases only, then, in which we are made to feel our ignorance of the true pathological nature of the disease, and to hesitate as to which of the organs we ought to refer all its phenomena. But even in these, we still find the affection of the bowels the earliest and most prominent feature; unless we except those cases, which, however, appear not to have been very frequent, of patients falling down in a state of collapse, from which they have never rallied, before any purging, vomiting, or other affection of the stomach and bowels had occurred. Mr. Scott, in his "General Summary of the Symptoms of Cholera," makes the following observations:—"Purging is a more constant symptom of Cholera than vomiting, *and in a majority of cases it is the first in the order of occurrence*; but being a less striking deviation from a state of health than vomiting, which instantly arrests the attention, it has usually been treated of in succession to it. This symptom has very rarely been altogether absent; but there seems no reason to doubt that this is sometimes the case. Its absence appears, indeed, to denote a peculiar degree of malignancy in the attack. The accounts given by the patients, however, in respect to their alvine evacuations, are not to be implicitly believed. Their attention is not always drawn to the nature of the

discharge, and they are apt to convey very erroneous notions on the subject to the medical attendant. *In cases where little or no purging has taken place during life, the intestines have yet been found after death to be filled with the conjee-like matter, as if they had wanted energy to throw it off, or as if a stricture had been formed on the lower portions of the gut.*" Thus we see that even in India, where the disease prevailed in all its frightful malignancy, symptoms referrible to a disordered condition of the bowels were usually the first indications of it; and that although the purging might not have occurred during life, still the bowels were found filled after death with the characteristic fluid. It is not improbable, however, that in these cases the morbid poison, whatever its nature may be, the application of which to the body is necessary for the production of the disease, may not be limited in its direct and primary operation to the bowels alone, but be extended contemporaneously to the nervous system in general, as distinct, however, from the sensorial. Whatever the nature of that morbid condition may be on which the first symptoms of the disease depend, and which, in our opinion, constitutes the first link in the chain of morbid actions, whether it be a rapid and violent inflammation of the mucous membrane or mucous glands,* or consist merely in congestion and extreme irritation, it becomes rapidly extended to the ganglionic system of nerves; first affecting their minute ramifications, then the larger trunks, and, finally, in all probability, the spinal chord itself. It now becomes comparatively easy to deduce from this pathological state all the more formidable and alarming symptoms. The muscular system will sym-

* Vide Dr. Hope on the Pathology of Cholera. Med. Gazette, Vol. IX., p. 905.

pathize with the irritation existing in the bowels, and cramps will be the consequence; the nervous system is shown to be involved in the same sympathetic actions, and the organs depending upon that system for the proper performance of their functions, will consequently be disturbed, and rendered unable to maintain their integrity; the heart's action will be weakened; the larger vessels will become congested, and the smaller collapsed; the respiration will be imperfect, or, at all events, its influence much reduced; the blood altered in its properties; the temperature of the body will sink, and the extremities and surface become discoloured; the secretions will be arrested; * and complete collapse more or less rapidly developed.

Such are the conclusions to which we have arrived, respecting the pathology of Cholera; and we are glad to see them confirmed by Dr. Brown,† of Sunderland, and Mr. T. M. Greenhow,‡ of Newcastle. The views of the latter gentleman so entirely accord with our own, that we have great pleasure in referring the reader to his work for a more full and detailed exposition of them.

Post-mortem appearances.—Not having witnessed a single examination after death of the body of a Cholera patient, it will not be expected that we should occupy our pages by detailing the results of investigations made by others: we prefer the shorter, and more satisfactory course, of referring the reader to any of the works already quoted, for all the information he can expect from such labours.

* Treatise on Cholera Asphyxia, by J. H. Bell, pp. 56, 57.

† Cycl. of Prac. Med., Vol. I., pp. 393, 394.

‡ On Cholera, p. 8 to 12, inclusive.

CHAPTER III.

TREATMENT—FIRST STAGE—SECOND, OR CHOLERIC
STAGE—THIRD, OR FEBRILE STAGE.

IN making the reader acquainted with the means which we have found most efficacious in the treatment of Cholera, it will be necessary, for the sake of greater clearness, that we should adhere to the same arrangement as that adopted when detailing the symptoms. We have seen that three stages of the disease may usually be recognised, and shall now proceed to point out the remedies applicable to each of them, as succinctly, and at the same time as clearly, as our experience will enable us to do. The very numerous and contradictory modes of treatment that have been recommended for the cure of this disease, although highly creditable to the zeal and activity of the profession, are nevertheless a sufficient proof that we are yet far from having obtained any remedy in which we are warranted to place much confidence. If we except the measures applicable to the first period of the disease, that stage of it which is most generally and easily controllable, we may safely assert that our knowledge of the means of cure is little better than presumptuous ignorance. And yet scarcely a week passes away without the discovery of another supposed "specific." If we may be allowed to judge of others by our own feelings, we are sure that medical men were never more puzzled in the history of medicine, than they have been lately,

to find out what are the real and unchangeable properties of their most common and familiar remedies; and never did they experience more severely the want of a new Treatise on Materia Medica, by which to relieve their fears and remove their ignorance. Medicines confessedly of no value in other complaints, have been brought forward as "specifics" in this; others have had new properties assigned to them, the very opposite to those for which they were previously esteemed; and our most powerful agents have been ascertained to possess no efficacy at all! Much of this contrariety and uncertainty has seemed to arise from the desire so natural in all, to discover some one remedy of unfailing efficacy, and applicable to every case. But it surely is not surprising that while we have no "catholicon" for fever, asthma, or hydrophobia, we should be without one for Cholera. Without laying any claim, therefore, to a specific for the worst forms of Cholera, which we are fully certain the nature of the disease entirely discountenances, it will not be inconsistent with our former expressions of distrust, to attach great importance to the remedies indicated in milder cases, and even to extend our approbation to some of those which we have certainly seen followed by good effects in some of the more malignant cases.

Treatment of the first stage.—The diarrhœa, so long as it continues bilious, and unaccompanied by tendency to collapse, we have almost invariably seen relieved by a grain or a grain and a half of opium, repeated at intervals according to circumstances, but seldom requiring to be exhibited oftener than twice in twenty-four hours, and generally a single dose has been found sufficient. If head-ache or dizziness, thirst, and a quick pulse, or much heat of skin, have been present at the

same time, we have taken a few ounces of blood from the arm, put the patient to bed, and ordered him to be kept moderately warm; but if the evacuations should have become thin, and scarcely coloured, we have usually conjoined with the opium a few grains of calomel, and this has been repeated every night, for a few days, until the secretions have been perfectly restored. The oppression and tightness, or sharp pain across the epigastrium, are best relieved by a mustard emetic. But generally, when medical advice is applied for, the evacuations have continued so long, or been so profuse, that their character is altered; they consist only either of clear water, or of the fluid so much resembling rice-water; the pulse is quick and feeble, and the surface cool; the stomach disposed to reject its contents, or having already done so; and there is danger lest the patient should become suddenly collapsed. We have now administered calomel more freely, in doses of ten grains or a scruple, but still united with a full dose of opium, and ordered them to be repeated if the bowels should continue to be purged, and the evacuations of the same watery character. In exhibiting emetics at this period of the disease, we have been much influenced by the greater or less tendency to collapse. If the disposition to it be great, and the stomach discharged of its contents by previous vomiting, we have not thought it quite safe to provoke the vomiting again; having sometimes observed it to continue in spite of every thing we could afterwards employ, until collapse has formed, and in a few hours the patient's condition become hopeless. We have preferred the application of mustard cataplasms to the stomach and bowels. The cramps may often be much relieved by cautious bleeding from the arm; but we have seldom had

recourse to this measure after the pulse had become feeble, and the skin decidedly cool. Frictions with a warm cloth have then been relied upon, together with the assiduous application of heat to the other parts of the body, and the exhibition of a moderate stimulus. Should the purging be relieved, the utmost attention will generally be necessary for several days, until the secretions have assumed a healthy character.

Second, or cold stage.—When this stage has fairly commenced, though the pulse may not only be perceptible, but capable of being readily counted, we have not thought it prudent to detract blood. Our chief anxiety has been to restrain the evacuations, so as, if possible, to afford the powers of life a chance of rallying. For this purpose we have employed calomel in scruple doses, every half-hour, and uncombined with opium; for if the latter be exhibited at this period, it not only affects the head with stupor, and paralyzes the whole system, but also fails to restrain the purging, and prevents that sedative influence of the calomel upon the stomach and bowels which, as far as our observation extends, is greater, and more to be depended on, than that resulting from any other remedy we have tried. Should the purging have ceased, we have still exhibited calomel to restore the secretions, nor have we found it produce a recurrence of the purging. On the contrary, when it has been given before the purging has ceased spontaneously, we have occasionally found it necessary to exhibit a dose of castor oil in order to obtain an evacuation. Should the irritability of the stomach be great,—and it is frequently one of the most distressing symptoms of the disease, and, when considerable, always a very formidable one,—we would recommend a total abstinence from fluids of all kinds; for their continued adminis-

tration is almost certain to increase the vomiting, and so to hasten the fatal termination. We would lay particular stress upon the recommendation totally to abstain from liquids; for we believe that no stimulus administered in that form can at all compensate for the ill effects resulting from a continuance of the vomiting. We have observed a few instances of perfect recovery from collapse, which we can attribute to nothing but a strict observance of the above plan. Calomel in large doses was repeated every half-hour until the purging and vomiting subsided; and not more than a small tea-spoonful of water was allowed at a time, and only then for the purpose of washing down the powders. External heat to every part of the body, and mustard cataplasms to the stomach and bowels, were, of course, contemporaneously employed. In this stage, and especially if the irritability of the stomach should have become impaired, as indicated by a spontaneous cessation of the vomiting, and not accompanied by a tendency to re-action in other organs, we have been less scrupulous in administering mustard emetics and other internal stimulants, though we have seldom seen any thing more than a temporary excitement produced by their use.

The mustard emetic has appeared to be most useful in the earliest stage of collapse, when the stomach is making ineffectual efforts at vomiting, the patient at the same time complaining of load and oppression at the precordia, and perhaps of a sense of coldness in the bowels: its effects in these cases have sometimes been extremely favourable.

We have not seen galvanism or any of the stimulating gases employed in this disease; but we should not be disposed to attach much value to any of them, if we may be allowed to judge from the accounts al-

ready published of their use. Dr. Wilson Philip, whose opinion on the employment of galvanism must be received with great deference, does not appear to estimate its importance very highly in Cholera.*

We have administered the turpentine injection in doses of four and six ounces, on several occasions; but seldom with any decided benefit. We have given the carbonate of ammonia every half-hour in many cases, in doses of five grains, combined with as much carbonate of magnesia: it has appeared to be most useful at the commencement of collapse, and when vomiting has not formed a prominent feature.

Third, or febrile stage.—Three grades of this fever are met with in practice; on each of which it may be necessary to say a few words. The *first* is that which usually follows every well-marked case of the disease in which the collapse has been slight, and imperfectly developed. It very much resembles a mild case of common contagious fever, but the general excitement is by no means so considerable as in the latter. It seldom requires any thing more than a few leeches, or a blister, and attention to the secretions.

The *second* chiefly occurs in young and middle-aged persons, of previous good health, and succeeds to collapse which, though sufficiently well-marked, had not been extreme. It is characterized by considerable heat of skin, a quick and moderately full pulse, a red or brownish tongue, pain in the head, chest, or abdomen, and sometimes by rather violent delirium; the stomach may be irritable, and the bowels relaxed or confined; the urine is extremely scanty for several days, and the thirst urgent. In these cases we have bled from the arm, if symptoms

* Observations on the Nature of Malignant Cholera. Pp. 41—43.

appeared to require it, or if local bleeding had been found to be insufficient. But we do not think that large bleedings can generally be borne. The sudden loss of a few ounces of blood has produced syncope, and the crassamentum has been ascertained to be loose and easily broken. The free application of leeches is much safer, and generally equally efficacious. Blisters and the application of cold to the head, or of fomentations to the abdomen, are extremely serviceable : and a due regard must be paid to the temperature of the body ; for, although the skin feels hot when covered with bed-clothes, its temperature soon sinks on exposure to the air. A dose of calomel should be administered daily, until the secretions are restored, and the saline effervescing mixture every two hours. Difficulty of breathing will sometimes be complained of without pain in the chest, which we have seen most certainly relieved by a mustard cataplasm. The urinary secretion in this, as well as in the form next to be described, requires time for its restoration ; and we have not found any remedy of much influence over it.

The *third* is that which occurs in old persons, and also in those of middle-age, if the collapse should have been extreme. It is marked by a want of power in the whole system ; by a feeble, slow pulse, and cool skin ; there is muttering delirium, or great irritability of the stomach ; and the secretions are much depraved, that of the urine being exceedingly scanty, and sometimes requiring the use of the catheter. It is of great importance in these cases to maintain the temperature by every possible means ; external warmth, the application of mustard cataplasms, and internal stimulants are all to be had recourse to ; while local congestions are to be re-

lieved by leeches and blisters, and the secretions restored by calomel.

In all, the diet ought to consist of mild and moderately nutritious food; and stimulants are seldom required, except in the cases last mentioned.

CONSIDERATIONS ON OTHER REMEDIES.

I. *Injection of saline solutions into the veins.*—This remedy, we believe, was first adopted by Dr. Thomas Latta, of Leith; and an account of the cases in which that gentleman employed it, was given to the public by Dr. Robert Lewins, in a communication addressed to the Central Board of Health. It is there stated that “the most wonderful and satisfactory effect is the immediate consequence of the injection. To produce the effect referred to, a large quantity must be injected, from five to ten pounds in an adult, and repeated at longer or shorter intervals, as the state of the pulse, and other symptoms, may indicate. Whenever the pulse fails, more fluid ought to be thrown in to produce an effect upon it, without regard to quantity. In one of the cases I have referred to, one hundred and twenty ounces were injected at once, and repeated to the amount of three hundred and thirty ounces in twelve hours. In another, three hundred and seventy-six ounces were thrown into the veins between Sunday, at eleven o’clock, A. M., and Tuesday, at four, P. M.; that is, in the course of fifty-three hours, upwards of thirty-one pounds. The solution that was used consisted of two drachms of muriate, and two scruples of carbonate of soda, to sixty ounces of water. It was at the temperature of 108° or 110°. The apparatus employed in injecting was one of Read’s common syringes.” * * * * *

“The idea of having recourse to this remedy in Cholera occurred to Dr. Latta, from being convinced that the evacuations, upwards and downwards, are in reality the serum of the blood; that it is the duty of the physician to replace it as speedily as possible by injecting a fluid, as similar to the serum as can be formed artificially, directly into the veins, which has been done here with wonderful, and as far as we can yet judge, excellent effect. An immediate return of the pulse, an improvement in the respiration and in the voice, an evolution of heat, an improvement in the appearance of the patient, with a feeling of comfort, are the immediate effects. The quantity necessary to be injected will probably be found to depend upon the quantity of serum lost, the object of the practice being to place the patient in nearly his ordinary state as to the quantity of blood circulating in the vessels.”*

A practice so simple, easy, and apparently devoid of danger, and promising to produce such wonderful and salutary effects in the most hopeless cases of collapse, was sure to be received with attention and interest by the profession at large; and, accordingly, in a very short time, a great number of cases were treated in the way recommended by Drs. Latta and Lewins. The result, however, of all the trials made is by no means favourable to its success, nor even to the propriety of its adoption. The number of recoveries after the saline injections is so small, notwithstanding the utmost attention to all the most minute details, and the greatest perseverance in the employment of them; while, on the other hand, the positive ill effects resulting from them in many cases

* Med. Gazette, Vol. X., p. 257.

are so obvious and objectionable, that the remedy seems now, by almost general consent, to have sunk into discredit and neglect. Dr. Lawrie, of Glasgow, appears to have made a very fair and extensive trial of it; and out of twenty-six patients who were injected with the saline solution, only four recovered. "Following the direction of Dr. Latta," says he, "I injected from seventy to one hundred and fifty ounces within a few hours; and *all* my patients, to the number of six, died. It is unnecessary for me to give you the details of these cases: in all of them temporary benefit was produced, but in several the fatal result seemed accelerated. I then tried, in one case, the addition of albumen to the saline solution; in another the serum of bullock's blood; in a third, human serum; in a fourth, the transfusion of blood; in two cases, small quantities of whiskey; in other two, a few drops of laudanum; and still all died. I began to suspect that the quantities injected were by far too great, notwithstanding the flattering statements which were published; and I resolved to limit the amount to thirty ounces at a time, to throw it in very slowly, and to watch carefully the state of the head and the respiration. Under these precautions four have recovered; but so many have died in despite of every precaution, so evidently injured by the practice, that I have now almost entirely laid it aside, as not only useless, but frequently hazardous. I have injected twenty-six cases, twenty-two of whom have died! Does any plan of treatment merit the name of a cure, under which nearly six out of seven perish?" To the four recoveries are appended, respectively, the following remarks:—

1. "Thinks the injection was beneficial: but has seen equally severe cases recover. It seemed to act

as a momentary stimulus, and did not in the least modify or diminish the secondary fever."

2. "Has seen more hopeless cases recover without injection; and the violence of the secondary fever leads me to think that in this case also the injection acted merely as a temporary stimulus."

3. "Injection certainly did good here: but as he passed his stools in bed after the second injection, (for which he had laudanum,) and drank a greater quantity of gin than any patient I ever attended, I think that in him also it was merely a temporary stimulus. Could not say that, but for the injection, the man must have died."

4. "A successful example of this mode of injecting."*

In a subsequent communication, Dr. Laurie observes,—“Since that time, I have tried in ten cases injection of distilled water, in quantities of from ten to twenty-four ounces; the patient being in the warm-bath at the time of injection. Two cases rallied, but died in secondary fever. A third was powerfully stimulated, sat up in bed, and sang a hymn, but died delirious in a few hours. None recovered; and the practice of injecting has since been laid aside as useless, if not injurious.”†

The bad effects resulting from the saline injections may be stated as follows:—

1. The vomiting, purging, and perspiration are generally increased.

2. Congestion of the head and lungs, but especially of the former, is often produced.

3. The consecutive fever is frequently more severe.

* Op. Cit., Vol. X., pp. 443, 444.

† Ibid., p. 670.

4. Fatal phlebitis, or permanent lameness of a limb, is not an unusual consequence.

Of about thirty cases that have been injected in this city, only four have recovered.

II. *Non-purgative neutral salts, commonly called the Saline Treatment.*—The employment of these boasted remedies for the cure of Cholera, the real value of which, however, seems yet far from being correctly ascertained, appears to have arisen from the curious and novel investigations of Dr. Stevens respecting the nature and treatment of the yellow, and other malignant fevers. In a paper communicated by him to the Royal College of Physicians in London, on May 3d, 1830, the following, among other results, were stated to have been observed :—

First.—That acids, as a general rule, render the blood darker ; and this in proportion to their strength. When any of the strong acids was mixed with a little water, and added to recently drawn blood, this immediately became changed from red to black. Even the vegetable acids produce this effect.

Secondly.—The pure alkalies produce a similar change, though not in so remarkable a degree.

Thirdly.—The neutral salts immediately give to venous blood a bright scarlet colour : this effect likewise resulting, although the alkali might be a little in excess, as in the sub-carbonate of soda.

Fourthly.—Even the black and morbidly attenuated blood, taken from the heart in fatal cases of yellow fever, was similarly changed into a bright red fluid by the addition of neutral salts.”*

And in a subsequent communication to the Editor of the Gazette, Vol. VIII., p. 740, are the following

* Med. Gaz., Vol. VI., p. 218.

observations :—“ That sickness of the stomach which is so generally met with in the commencement of all those (malignant) fevers that are produced by the specific aërial poisons, is probably the effect of the poison itself, which is thrown out of the circulation, and causes irritation in the gastric organs, in the same way that tartarized antimony produces nausea and vomiting when we inject a small portion of that agent into a vein : when proper remedies are used, that sickness at the stomach which begins with the disease soon passes away ; but that peculiar irritation in the gastric organs which comes on at a later period, and which is often so distressing in the last stage, is evidently in these fevers produced in a great measure by an excess of acidity in the gastric organs. This may perhaps arise from the decomposition of the saline ingredients of the blood by the nervous or electric fluid, which appears to exist in excess in all fevers, but particularly in those of a malignant character. After the decomposition of the saline matter, the acids of the salts may be attracted into the gastric organs, where they exist in excess, and act as a source of intense irritation. This, however, is in part theory : but there is no question of the fact, that there is in all the malignant fevers of the new world, particularly in the last stage of these diseases, an excess of acidity in the alimentary canal, which extends from the very tip of the tongue to the verge of the anus. When we apply at this period of the disease a piece of litmus paper to the foul or red irritable tongue, the test is reddened almost instantly ; and when we apply the same paper to the fluids ejected from the stomach, it is reddened almost as suddenly as if it had been dipped in a pure acid. In fact, even the matter of the black vomit (which is

merely an internal effusion of the black and dissolved blood) receives such an addition of fixed acid in the stomach, that it effervesces freely with the alkaline carbonates." * * * * * "It may easily be ascertained by the litmus paper, whether there be or be not, in Cholera, an excess of acid either in the blood or in the fluid ejected from the gastic organs. If there be an excess of acid, then the alkaline carbonates are the remedies, of all others, the most likely to be useful; if there be no excess of acid, then the mixture of muriate of soda and nitrate of potash may possibly be preferred; and as all parties agree in admitting that, during the first stage of Cholera, (?) the blood is not only diseased, but black in colour and thickened in consistence, I am inclined to believe that, under all circumstances, the non-purgative saline medicines are the remedies, of all others, the most likely to be useful; for they not only redden the colour of the blood, but, by increasing the fluidity of its solid ingredients, and adding to its stimulating power, they will render the blood more fluid, and of course better fitted to serve the important functions which it is intended to perform in the living system." * * *

* * * "From what I have seen of their effects in other diseases, I have little doubt that, if the saline medicines be fairly tried, the mortality from Cholera will be considerably less than it has hitherto been."

And, lastly, "The Indian Cholera is a most malignant disease, produced by the existence of a specific and virulent poison in the system which contaminates every drop of the blood, and excites diseased action in every solid of the body."

In consequence of these facts and suggestions of Dr. Stevens, and some almost equally strong state-

ments by Dr. P. S. Knight, the practice of treating Cholera with the saline remedies was soon extensively adopted ; with very different degrees of success, however, but certainly on the whole with more instances of failure than of success. On the 21st of April, 1832, a communication appeared in the Gazette relative to the treatment of Cholera in the Coldbath-fields Prison. "The first four cases were treated in the common way, with brandy and opium, an ammoniated mixture, ginger, sinapisms to the region of the stomach, the hot air-bath, &c., and all of them died after a short illness. Nineteen recovered under the saline treatment, which was as follows:—When the patients were first admitted, the following powder was immediately given, either in half a tumbler of tepid water, or occasionally in a little thin, clear beef-tea : super-carbonate of soda, half a drachm ; muriate of soda, a scruple ; chlorate of potass, seven grains. This was given every hour, and continued till the patients were recovering from the state of collapse ; after which it was diminished in frequency, in proportion as the re-action increased. Of seventeen other cases, treated in the same way, only two died, and they were relapses ; the other fifteen recovered. So that of thirty-six cases that were under the saline treatment, the total amount is two deaths and thirty-four recoveries." In a subsequent communication from Mr. Wakefield, the following particulars are stated :—"When used at an early period, it either prevents or arrests the progress of the fatal symptoms ; and even where this treatment is not used until a later period of the disease, its effects are distinctly marked ; and I may safely say that I have seen several most malignant cases recover from the state of collapse under

the saline treatment, when the patients, I doubt not would have died under any other practice."

"From the commencement of the disease up to this date (April 25), there have been nearly one hundred cases where individuals have been more or less evidently labouring under the influence of the Cholera poison. Twenty-five of these assumed the malignant character of the disease, having the majority of the symptoms described in the printed document issued by Dr. Macann. Four of the first cases, as before observed, were treated in the common way, and every one of them died. All the others, however, were immediately put under the use of the saline practice as recommended by Dr. Stevens; and out of the whole number who have been thus treated, we have only had three deaths from Cholera, and two of these were cases of relapse." Such is the account given by Mr. Wakefield of the results of the practice in Coldbath-fields Prison; and it might have been expected that the adoption of the same plan in other places would have been at least favourable to the reputation of the remedies. We are obliged to confess, however, that so many instances have been reported, tending to throw discredit on them, that we must, in fairness to all parties, attribute their failure either to the total inefficiency of the remedies themselves, or to some real, though not very obvious differences in the character of the disease in different places. That this last does occur to some extent we are inclined to believe; but it only tends to show that the saline treatment is far from deserving universal adoption. Besides, it must not be concealed, that the facts, as just detailed, have been called in question by Sir D. Barry and others, who state that, on visiting the prison, they could not ascertain that nearly so many

cases of the real disease had occurred, as were represented by the surgeon. Without entering into the merits of the controversy, however, we have a right at least to assume (for it is not denied by either Mr. Wakefield or Dr. Stevens) that by far the greater number of cures were effected in persons suffering only from premonitory symptoms; and if we take into account the ambiguity of these symptoms, (for they might have been produced by other causes than those capable of producing Cholera,) and the facility with which they are cured by equally simple remedies, we must conclude that the saline treatment, like every thing else, generally fails in cases of great malignancy. In our own practice, and from what we can learn from others, it seems generally to have been inadequate to check the vomiting; in many cases it has either increased the purging, or failed to control it; nor has it prevented what at first were considered mild cases, from going into collapse. With respect to the change of colour effected by the salines in the blood out of the body, our friend, Mr. James Allen, has stated that the same is produced by calomel.

III. *Cold water treatment.*—Of this remedy, first recommended by Dr. Shute, of Gloucester, we are quite at a loss to form an opinion; and therefore content ourselves with waiting for the results of more numerous and well-authenticated trials of it. When the account of its success reached this city, the disease had so far declined, that but few cases have since occurred. We are informed, however, by our friend, Dr. Belcombe, that in two cases in which he tried it, one of them, a mild case, recovered, while the other, a malignant one, died quite as rapidly as if no means whatever had been employed.

CHAPTER IV.

FACTS RESPECTING THE PROGRESS OF THE DISEASE IN
YORK.

BEFORE entering into a minute detail of the facts which we have observed, and been enabled to collect, respecting the rise and progress of Cholera in this city, it may be useful, in order to a right appreciation of their value, to premise a few observations respecting the general health of the inhabitants immediately previous to their visitation by that most fatal and mysterious disease; and also to inquire whether there existed any causes, the ascertainment of which was possible, by whose operation we might be enabled to account for the local origin and subsequent extension of the disease.

The inhabitants of York were threatened with an invasion of Cholera for several weeks before it actually occurred among them. Goole, Hull, Selby, and Leeds, were all suffering under its ruthless and fatal grasp; some of them for at least a month before the first case occurred in this city. The proximity of some of those places to York, and the constant intercourse maintained between them by coaches and other means, were considered by some as highly favourable to the importation of the disease, if its extension depended upon any contagious principle; and accordingly all the more common and generally useful means of prevention were had recourse to. The

poor were supplied with food, clothing, blankets, &c. ; their habitations were regularly visited by parochial boards, and every source of filth was as completely destroyed as possible. The rooms of such as were unable to do it themselves, were properly cleansed and white-washed at the public expense ; and privies, soil-holes, pig-styes, &c. &c., all underwent the most scrupulous examination and censorship. The medical men (one of whom was always included in each parochial committee) were requested to make accurate and strict inquiries into the state of the public health, and to report the same to the General Board, and had the satisfaction, week after week, of declaring that never in the whole period of their professional existence had so little disease prevailed, or so few opportunities occurred for the exercise of their medical skill. No one dreamt that we were just on the eve of a formidable and severe irruption of Cholera, because, as far as human means are available, every thing had been removed that was considered likely, or even possible, to generate the disease ; and every body felt confident, that supposing it to be contagious, and to extend itself by that means alone, it would nevertheless be met by so much cleanliness, comfort, and temperance, that it could hardly obtain an extensive prevalence among us. And when at last it did appear in its undoubted character, it was not ushered in by any extraordinary conflict of the elements ; by meteors, lightnings, thunderings, hail-storms, or hurricane ; but suddenly and insidiously, almost before the expiration of a week of more than ordinary joyousness and merriment ; in short, it appeared just after our races ; and was beyond all doubt introduced by some of the ragged and beggarly "gentle-folk," who had come to be present at our "festivity,"

and to profit as largely as they could by the folly and vices of other people. That it was by such means that the disease was introduced into York, there cannot be any reasonable doubt; especially if we consider, that some of the earliest cases occurred in the persons of vagrants, who, when they were taken ill, would not indeed confess that they had come directly from infected persons, but many of whom were known to have travelled from Selby, Hull, and Leeds, all at that time suffering from the prevalence of the disease. Unless we altogether deny the strongest presumptive evidence, to say the least of it, it seems quite impossible to get over the facts of its probable introduction into York; and if we reject them, because they do not amount to mathematical demonstration, we have no alternative left but to confess that we know nothing at all about the matter, and are determined that we *will* know nothing about it. That the disease cannot be attributed to a *malarious* origin, at least in this place, is too obvious to require any further proofs than such as are well known to every medical man in it. The truth is, that at no time do we ever suffer from *malaria* to any extent, and the districts in which that agent might be supposed especially to reside, have never yet been visited by the Cholera. It has been confined to places into which it was originally introduced, or into which it afterwards spread by infection, contagion, or by whatever other name we choose to designate that peculiar human effluvium, which, arising from a sick person, is capable when sufficiently applied to one in health of producing the same disease in him.

(1.) The first case of Cholera in this city occurred on the 2d of June last, in the person of Thomas Hughes, aged 21 years, residing in a court at the bottom of Skeldergate, a street running parallel with

the river Ouse. This man was reported to have been suffering from chronic diarrhoea for some months previously; he was a person of intemperate habits, and in a state of considerable destitution. On the 28th of May, and two following days, he had been employed in ferrying across the water, persons of all kinds from Selby, Hull, and other infected places, some of whom afterwards sustained very severe attacks. He recovered after experiencing a pretty severe attack, with consecutive fever. (2.) On the 7th, his brother, William Hughes, was attacked; (3.) and on the 8th, John Hughes, aged 52, father of Thomas and William H. (4.) On the 12th, James Kendle, aged 39 years, residing in Water-lane, on the opposite side of the river. He was uncle of Thomas Hughes, the first patient, who, on being taken ill, had called at his house, and remained there some time; after which he accompanied him home. (5.) On the 13th of June, aged 19, the daughter of James Kendle was also attacked. (6.) On the 5th, John Graves, living in the same court with the first patient, was reported. It was not proved that he had any personal communication with Hughes, but he used the privy into which all that person's evacuations were thrown. He was attacked at three A. M., and died at four P. M.; (7.) and on the 12th, E. Graves, wife of the above: she recovered. (8.) On the 6th, Abraham Peck, aged 62, living in the same place. He was removed to the Cholera Hospital, and eventually recovered. (9.) On the 7th, E. Rankin was attacked; also residing in the same court. (10.) On the 11th, M. Fentiman, aged 42, also living in the same place. (11.) On the 17th, T. Torre, aged 8, living in the same place; (12.) and the same day, Mary Pears, aged 64, also living in the same place.

(13.) On the 5th, J. B., aged 45, a publican, in the first Water-lane : he died the same day. This man was drinking with two others, one of whom, (14.) Captain C., took the disease on the 10th, and died on the 14th, and had just come down the water in a boat from an infected place. J. B. was waited upon by (15.) Mrs. F., aged 65, living in the same place, at that time quite healthy. She was attacked on the 6th, and died on the 7th. (16.) This woman's husband was also attacked, but not until several weeks after his wife's death. (17.) On the 13th, W. S., in the same place, was attacked. (18.) The person with whom he was in daily intercourse at work, died of the disease a few days before, viz., on the 7th. (19.) On the 15th, J. W., aged 13, in the same place. Reported to be "living near to persons dead in the disease." (20.) And on the 16th, J. B., aged 38, also living in the same place.

(21.) On the 5th of June, E. Grant, a vagrant woman, representing herself to have come from Whitby, lodging in the second Water-lane : she recovered, but not without sustaining severe consecutive fever. (22.) On the 13th, A. P., the keeper of the lodging-house, was attacked. (23.) On the 10th, another case (name lost) reported in the same place. (24.) On the 15th, G. G., aged 10 : same place. Reported to be "living next door, as well as opposite, to Cholera cases." Died the same evening. (25.) On the 21st, A. F., aged 52 : same place. This woman had washed the clothes of a person of the name of Doughty, who was removed to the Cholera Hospital from another part of the town, and died there on the 19th. (26.) Doughty's child, aged 10 months, was sent to A. F.'s, after its mother's removal to the Cholera Hospital. It fell ill on the same day, and died on the 21st. (27.) E. D.,

aged 19, who waited upon Doughty, was taken ill on the 19th, but recovered.

(28.) Also on the 5th, a woman lodging in the third Water-lane, a vagrant. Removed to the Cholera Hospital, and died the same day. (29.) On the 11th, R. C., aged 45, lodging in the same house; (30.) and on the 12th, M. M., aged 59, also lodging in the same house. Died in the Cholera Hospital. (31.) On the 8th, A. N., aged 25, daughter of a publican: she was supposed to be infected by a man who was drinking at the house, his wife being ill in the disease at the time. (32.) On the 10th, J. W., aged 65, residing in the same place; he was removed to the hospital, and died there: (33 and 34.) and on the 13th, his wife and daughter were also both attacked.

(35.) On the 13th, another vagrant, of intemperate habits, in the lodging-house above-mentioned; (36.) and on the same day, A. F., aged 60, living in the same place.

(37.) On the 12th, Mrs. B., wife of a publican, was reported, and died the next day. (38.) On the 14th, Mr. C., aged 75, in respectable circumstances, residing about one mile out of town: he died on the 16th. He had been at Mrs. B.'s house for a newspaper, and remained there a short time. (39.) And on the 24th, H. H., aged 45, a painter, who died next day. This man cleaned Mr. C.'s house after his death, and, I believe, assisted to lay him out.

(40.) On the 13th, J. L., aged 62, third Water-lane; he died: (41.) and on the 15th, in the same place, T. W., aged 68, who died on the 18th; (42.) and J. G., aged 40, who recovered.

(43.) On the 15th, J. H., aged 45, living in the same place: he died on the 16th; when (44.) his wife, aged 53, was attacked.

(45.) On the 18th, A. G., aged 29, living in the room above that of J. L. (No. 40.)

(46.) On the 17th, J. E., aged 15, residing in the shambles; he died on the 24th: (47 and 48.) and on the 21st, W. E., the father, and W. E., the brother: (49.) and on the 26th, M. H., aged 28, who was sent to wait on the above family: she died on the 27th. The disease was *supposed* to have been conveyed to the above by means of a close-stool, which was borrowed by Mrs. B., (No. 37.) and used during her attack. It was afterwards returned to the owner, who, fearing it might be dangerous to retain it, on account of its great offensiveness and use by a Cholera patient, caused his son, J. E., to convey it upon his shoulders, and throw it into the river.

(50.) Also on the 5th of June, M. W., aged 30, residing in Swan-street, Nunnery-lane: died the following day. This young woman, who was pregnant, had been in lodgings in Swan-street for some time; and as the period for her confinement approached, was urged to remove to the house in which she was attacked with the disease and died. This house was occupied by a man and his wife, who travel the country with small articles of traffic; and two or three months before the case of M. W. occurred, they had been at Newcastle, where the disease then prevailed. On returning home to York, the husband almost immediately set out in another direction to pursue his trade, leaving his wife at home. She invited a young man from a different part of the city to share her bed; and it is very remarkable, that during the night he was attacked with a *bowel complaint*, and died early the next morning. The woman and her son were also slightly attacked, but recovered. These cases are *now* supposed to have

been genuine Cholera, by the surgeons in attendance at the time. Soon afterwards the wife set out in pursuit of her husband, and the house remained unoccupied till her return, a day or two before M. W. entered it, who slept on the same bed on which the young man had died, and on which she herself died also on the 6th of June. (51.) On the 9th, the wife before mentioned (Mrs. H.) was attacked; (52.) and on the 13th, her son, aged 15: they both recovered. (53 and 54.) M. W.'s father and mother came to York, from a village near Malton, to attend their daughter's funeral, and take possession of her clothes; on their return they were both attacked by the disease, and died.

(55.) On the 14th, W. G., aged 35, a blind and delicate man, was attacked in consequence of being exposed to M. W.'s evacuations, and died on the 15th. (56.) T. D., aged 77, the father of Mrs. H., living full two miles from her residence, in a healthy part of the city, visited the house during M. W.'s illness, and on returning home was attacked, and died on the 9th. (57.) On the 12th, H. B., aged 26, was reported as follows: "A decided case; living in the next house to that in which T. D. died."

(58.) On the 16th, J. F., aged 43, residing in Swan-street, was attacked, and died in the Cholera Hospital on the 17th. He had had communication with the above cases; (59.) and on the 17th his wife was attacked, but recovered.

(60.) Also, on the 16th, in the same neighbourhood, T. S., aged 60; (61.) and on the 21st, S. C., aged 7: they both recovered.

Many other cases occurred in this neighbourhood, and we are informed by the surgeon of the district, that every one of them could be traced to distinct communication with the sick.

The following cases occurred under our own observation in the Workhouse.

(62.) The first person attacked was Sarah T., aged 26. She had laboured under diarrhœa nearly a week without asking for advice; was taken in labour on Friday, the 22d of June, when it was discovered that she suffered from diarrhœa. She became seriously worse on the Wednesday following, and died on the Friday. (63.) Her child died of the disease on the Monday preceding.

(64.) A. B., aged 75, an idiot, was attacked with purging on Friday the 22d, but did not make it known till Tuesday the 26th; was then prescribed for, and seemed better: but on Wednesday afternoon she became seriously worse, and died on Thursday. She emptied all S. T.'s chamber vessels.

(65.) M. B., aged 50; attacked on Friday the 29th, about one, A. M.; was visited at half-past two, A. M., when she was completely collapsed. Died in the Cholera Hospital the same day. She slept in the same room with A. B.

Others slept in the same room, and Ann Wilson in the same bed with A. B., who nevertheless escaped; but (66.) M. B., aged 19, who slept with Ann Wilson after A. B.'s death, was attacked on Saturday the 30th. She was removed to the hospital, and recovered.

(67.) W. B., attacked on Friday, the 29th, with purging, but did not complain till Sunday, July the 1st. He assisted about M. B., (No. 65.) and made a fire in the adjoining room. He recovered.

(68.) D. D., aged 17; attacked July 1st: slept in the next bed to A. B. (No. 64.) She recovered.

(69.) Mrs. W., aged 45, was attacked with suspicious symptoms, on Friday, after being much alarmed at

M. B.'s case. (No. 50.) She waited upon the first three who were attacked. She recovered.

(70.) C. A., aged 80, attacked July 2d. Slept in the same room with M. B. (No. 66.) She recovered.

It is hardly necessary to say, that every case of Cholera was isolated as soon as the symptoms were made known; but the patients often neglected to speak of them until they had existed some time. The house contained at the time of the irruption of the disease, about fifty paupers; and the probability is, that had not the most active measures been taken to prevent its extension, many more would have suffered an attack. The introduction of the disease into the Workhouse was probably occasioned by one of the old women, who about a week previously had been taking tea at her sister's, in the third Water-lane. On her return, she told some of the inmates of the house, that a person had been that morning removed to the hospital from the house opposite to her sister's. Though she escaped, her husband was affected with severe diarrhœa; and S. T., the first patient, had more frequent intercourse with her than any other person, except her husband.

It has also been satisfactorily ascertained, in those villages in the neighbourhood of York which have suffered from the disease, that it has uniformly been conveyed to them by persons who had sustained exposure to the affected, either in York or elsewhere.

TABULAR ARRANGEMENT OF CASES OF CHOLERA, AS THEY
OCCURRED IN YORK.

Date. 1832.	Remaining at Last Report.	New Cases.	Dead.	Recovered.	Remaining.
June 2	0	1	0	0	1
4	1	1	0	0	2
5	2	5	3	0	4
7	4	3	2	0	5
8	5	4	1	1	7
9	7	2	0	0	9
10 and 11	9	7	3	0	13
12	13	5	1	0	17
13	17	10	3	3	21
14	21	11	2	1	29
15	29	8	5	0	32
16	32	13	4	3	38
17 and 18	38	16	3	10	41
19	41	13	3	7	44
20	44	7	2	5	44
21	44	3	3	11	33
22	33	4	0	6	31
23	31	6	2	5	30
24 and 25	30	16	7	3	36
26	36	11	4	4	39
27	39	11	5	7	38
28	38	7	1	4	40
29	40	5	3	8	34
30	34	5	3	6	30
July 1 and 2	30	44	17	10	47
3	47	17	5	9	50
4	50	10	3	11	46
5	46	20	6	4	56
6	56	20	6	3	67
7	67	16	3	8	72
8 and 9	72	23	14	13	68
10	68	7	10	13	52
11	52	7	3	8	48
12	48	5	1	3	49
13	49	6	3	10	42
14	42	10	4	6	42
15 and 16	42	6	3	10	35
17	35	3	5	6	27
18	27	6	3	4	26
19	26	3	3	2	24
20	24	4	0	0	28
21	28	1	1	6	22
22 and 23	22	2	2	10	12
24	12	0	0	1	11

TABULAR ARRANGEMENT OF CASES OF CHOLERA, AS THEY
OCCURRED IN YORK.

Date. 1832.	Remaining at Last Report.	New Cases.	Dead.	Recovered.	Remaining.
25	11	0	0	3	8
26	8	1	1	1	7
27	7	2	0	2	7
28	7	3	2	1	7
29 and 30	7	6	3	0	10
31	10	0	0	1	9
August 1	9	2	0	1	10
2	10	0	0	4	6
3	6	0	0	3	3
4	3	1	1	2	1
5	1	0	0	1	0
6	0	0	0	0	0
7	0	1	1	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	1	0	0	1
12	1	1	0	0	2
13	2	2	2	0	2
14 to 20	2	1	1	1	1
20 to 27	1	5	2	0	4
27 to Sep. 3	4	23	12	3	12
3 to 10	12	9	5	8	8
10 to 17	8	3	2	4	5
17 to 24	5	2	0	5	2
24 to Oct. 1	2	1	0	2	1
1 to 8	1	2	1	0	2
8 to 15	2	0	0	2	0

Total..... 450. Died..... 185. Recovered..... 265.

The population of the city, according to the last census, is estimated at 25,357; so that rather more than one in every fifty-six of the inhabitants has sustained an attack of the disease.

The respective Age and Sex of those who died may be seen in the following Table:—

Age.	Male.	Female.	Sex not Reported.	Total.
Under 12 Months	2	2	3	7
Between 1 & 2 Years	1	—	—	1
2 and 5	4	1	—	5
5 and 10	5	4	—	9
10 and 20	8	1	—	9
20 and 30	7	17	—	24
30 and 40	9	14	1	24
40 and 50	15	8	2	25
50 and 60	23	8	—	31
60 and 70	15	7	—	22
70 and 80	13	7	—	20
80 and 90	2	—	—	2

Total whose Age and Sex were reported 179

Males (Age not reported) 2

Neither Sex nor Age reported 4

Total 185

CHAPTER V.

CAUSES OF THE DISEASE.

SECTION I.—PREDISPOSING CAUSES.

It appears to be a general law, and one that is acknowledged by all medical philosophers, that the propagation or extension of every epidemical disease, whether contagious or otherwise, is very considerably influenced by certain causes, which have been aptly and properly denominated *predisposing*. That is to say, there are certain circumstances in which persons may be situated, or to which they may be exposed, which have the power of rendering the subjects of them highly susceptible of morbid actions, and, consequently, extremely liable to suffer from any prevalent disease, if sufficiently exposed to the primary, or exciting causes of it; though other persons similarly exposed to them may escape, from the absence of that pre-disposition. Of these, grief, fear, delicate health, want of food, insufficient clothing, extreme labour, fatigue, exposure to cold and wet, are the chief. But it may sometimes be observed, that the *efficient*, acts also as the *predisposing* cause. Thus, a person exposed to malaria, though possessed of every personal comfort, and in robust health, becomes, by that exposure, predisposed to be affected by it; and, in that condition, the predisposing will now act as the exciting cause. In no disease whatever has the influence of predisposition been better or more clearly ascertained, than in the one now under consideration.

Every where, the most numerous victims to the Cholera have been found amongst the poor, intemperate, timid, aged, or delicate; and it may, perhaps, be safely asserted, that in no case are the effects of *fear*, especially, more palpable and destructive than in this disease; for, whether we regard its cause as acting primarily upon the nervous system, or upon the stomach and bowels; still, we know of no affection of mind or body, whose operation is more powerful than fear on all those organs. It is perfectly well ascertained that fear, by disordering the functions of the stomach, will produce sickness, purging, griping pains in the bowels, and even cramps of the extremities; and we are morally certain that we have observed many cases in which all these symptoms have been produced by that cause alone; for they have occurred under circumstances in which no other agent could reasonably be supposed to operate at the same time. Indeed, from all that we have witnessed, we are very much inclined to attribute the extensive prevalence of dyspeptic symptoms, and especially of diarrhœa, so generally, if not constantly, observed among the inhabitants of places suffering from Cholera, to the direct operation of those predisposing causes to which reference has already been made; and not to the existence of any “choleric constitution of atmosphere,” on which so much stress has been laid by certain medical observers. For when is it that we witness these effects most extensively? It is not *just before* the Cholera makes its appearance in any locality, though according to the opinion of the advocates for “an epidemic influence in the air,” such might naturally be expected to occur; it is not *immediately after* it, for we find every where that some time must elapse before the inhabitants can be

brought to believe that any unusual cause of disease is in operation amongst them, as is incontestably proved by the malignity so generally manifested by the lower orders, especially, to the medical men; to whom have been attributed all kinds of revolting and disreputable motives, while discharging the high and imperative duties of their professional calling. And we believe that every person who has had experience in the disease will readily admit, that though deaths from Cholera may be occurring day after day, yet so far are the majority of the people from suffering under any analogous ailments, that they will persist in denying the existence of the disease altogether, or indeed of any disease at all resembling it. No: it is not until the ravages of the pestilence have become so palpable and undoubted that every person becomes more or less alarmed for his own personal security, that any of these dyspeptic symptoms are observable; and then suddenly, and all at once, every body seems to be affected by something, which, instead of being attributed to the operation of moral causes, quacking, improprieties in diet, &c., receives a ready and easy solution by the supposition of an "epidemic influence." That this is not an exaggerated statement, might be readily shown by a reference to competent authorities, and many of them *anti-contagionists* into the bargain.

Let us see what Dr. Lefevre (himself an anti-contagionist) says, in his account of Cholera in Petersburg: "It is impossible to measure the effects of fear upon the human mind, or to calculate the action of the latter, under uneasy impressions, upon the body itself.

"It is not possible to say whether this was the real and only cause, but certain it is, that during the larger portion of the time during which the Cholera

prevailed, there was a general indisposition, a certain *malaise*, which affected almost every individual. People complained of uneasy sensations in the bowels, a certain feeling which was new to them, a sense of dragging down, and a loss of tone in the whole system.

“ This affection, whatever it might have been, was not under the control of medicine; it subsided with the decline of the disease; *hence I attribute it to nervous affection, and the effects of fear.*”* Again, “ Of all causes which predisposed to this disease, moral affections were found the most frequent; and their baneful effects were not merely confined to rendering their victims more susceptible of the malady, but they produced a decidedly fatal influence upon the constitution itself. That many died of fright was a phrase re-echoed by every medical man in the city, and *fear* may consequently be considered as the chief predisposing cause.”†

Mr. Moir appears to entertain precisely the same opinion, as the following quotations will show:—“ As a striking proof of the influence of mental affections on the digestive process, dyspeptic symptoms, followed by a tendency to diarrhoea, will be found to prevail generally wherever Cholera is committing its ravages.”‡ And in the next page he observes, “ All nervous apprehension is hurtful, and to preserve a calm and cheerful mind is of the utmost consequence in warding off the attacks of this disease.”

Dr. Becker's remarks upon this subject are so conclusive, and so ably stated, that we cannot refuse the pleasure of quoting them at large, even at the

* Lefevre's Observations on Cholera Morbus, pp. 22, 23.

† Ibidem, p. 24.

‡ Prac. Obs. on Malignant Cholera, p. 10.

risk of incurring the charge of tediousness :—" I have last to advert to the remark almost universally made in those European cities in which the Cholera has appeared, viz., that the great body of the population is subject to morbid feelings, derangements of the digestive organs, diarrhœa ; that, in other words, the choleric influence is in an unequal degree distributed amongst all. How is this singular phenomenon to be accounted for ? In the *first* place, it is true that a certain number of persons in places where Cholera prevails, labour under diarrhœa and vomiting, with other symptoms, which we may consider as the Cholera in a very slight degree. The number of persons thus affected is very different, according to the facility with which intercourse takes place in an infected town, between the sick and those who are more or less disposed to the influence of the contagion. At Berlin, the number of persons subject to this Choleric diarrhœa has been inconsiderable ; they have been, almost exclusively, those who attended upon Cholera patients. We have already remarked, that in the Hospital, No. 1, of seventy to eighty attendants, eleven had Cholera, and thirty-five others this diarrhœa, with vomiting, &c.

" *Secondly*, common diarrhœa, cholic, and oppression at the stomach, produced by the usual causes of these complaints, occur during Cholera, as at all other times : but those who habitually took little notice of similar complaints, are now alarmed, send for a physician, talk much of their ailments, and make their friends talk much more of them. In this manner every day's occurrences are rendered the subject of public attention.

" In the *third* place, derangements of the digestive organs are actually brought on by the sudden change

of diet and regimen, which most persons thought it necessary to have recourse to at the approach of the Cholera. From an almost ridiculous horror entertained of every thing laxative, it was urged that cold water, small beer, fruit, not only raw but even stewed, and many other articles of diet, in daily use, are noxious, and that white wine also is to be avoided: on the other hand, it was recommended to drink freely of red wine, and of spirituous liquors, besides which a variety of 'preservative' drops, pills, and powders, were swallowed:—and could it be expected that the stomach was to submit to all this violence and absurdity with impunity? Costiveness, flatulence, colic, and diarrhoea alternately followed in the same persons, and made some of them truly miserable.

“The *fourth* element, however, in this epidemic *malaise*, is the influence of the mind upon the body, and especially upon the digestive organs. One must have experienced, in one's own person, the singular feelings of a first week of Cholera, in order to conceive it possible, how much not only hypochondriacs, but individuals in excellent health of body and mind, free from all fear and anxiety, may thus suffer, merely in consequence of consciousness being directed towards the function of digestion. In some persons, a feeling of discomfort has continued for days and weeks: they have been languid, little inclined to their usual occupations; the stomach, as well as the lower part of the intestines, have been the seat of unusual sensations; the peristaltic motion has been perceived (usually described as *rumbling* in the belly); and their sleep was disturbed by the involuntary thoughts of the approaching disease. In others, however, a sudden attack of anxiety, op-

pression of the chest, shivering, coldness of the extremities, has supervened, and caused great alarm to the patients and to their friends: on such occasions, cordials, warm drinks, and external warmth, were instinctively had recourse to, and uniformly followed by a most profuse sweating, which, having continued for a night or a day, left these individuals tolerably well, but weak and languid, and their stomach deranged by the prodigious quantities of fluid which they had often been forced to take by their apprehensive friends. In many instances, an attack of this description turned out to be the first paroxysm of a mild intermittent fever, which recurred with its usual symptoms, in the tertian type; the phenomena of the first fit only having been masked, as it were, by the 'epidemic constitution' of the mind. Few of the persons, however, affected in the manner now described, are disposed to ascribe these symptoms to their own manner of living, and to the influence of the mind; few of them, indeed, are aware of the general dependence of the corporeal functions upon the workings of the mind, particularly where these are uninfluenced by the will, or even by clear and distinct consciousness.* We can-

* "I do not hesitate to say that I have made no exception to the general rule; and that, from the day and hour when I had performed the first Cholera dissection, for at least a week I was in a peculiar state of excitement, which was soon followed by a transitory derangement of the digestive function, and increased and decreased as I thought myself more or less exposed to the effluvia of Cholera. I have witnessed several cases, in which the above attacks supervened immediately upon reading in the newspaper the daily report of the sick; in other instances, they supervened upon having witnessed the transport of a Cholera patient: hence they have, in my practice, been more common among those who lived in the streets near the Cholera Hospitals, and on the road to the burying ground, and who were fre-

not, therefore, be surprised that there is, on the part of the public, a general tendency to ascribe these phenomena to a prevalent 'epidemic influence;' nor that many medical men also proclaim this influence. We accordingly have had at Berlin, besides the genuine Cholera, a 'pseudo-cholera,' 'cholerina,' 'choleroid,' or, as others have termed it, a choleric anxiety."*

Enough has now been adduced to show that in estimating the causes of Cholera, we ought by no means to neglect, or lightly esteem, those which have been called predisposing causes, inasmuch as there is great reason to believe, that the direct operation of the latter is frequently mistaken for that of an "epidemic constitution of atmosphere;" and advanced as a striking and remarkable confirmation of the views of the anti-contagionists.

We have been the more particular in insisting upon the influence of these causes, and of fear especially, because we know there are many persons who nearly or altogether deny that they exert any appreciable effect whatever; and while the contagionists are alleged to assume by far too much in supposing the existence of predisposing causes to the extent now described, and the necessary operation of predisposition to the reception of contagion, it does not appear to have been sufficiently acknowledged, that whatever the cause of the disease may be, whether "contagion" or "epidemia," it becomes equally necessary to suppose the existence and operation of predisposition; otherwise, how is it to be accounted for, that only a few comparatively of all that are

quently annoyed by the sight of the Cholera-baskets, and by the nightly rumbling of the waggon which carried the dead."

* Becker's Letters on the Cholera in Prussia. Letter I. Pp. 28—30.

exposed to so general a cause as that of an "epidemic constitution of atmosphere" suffer an attack of the disease; and in what respect do the circumstances differ, when instead of the terms "epidemic constitution of atmosphere," we substitute the word "contagion?"

SECTION II.—EFFICIENT OR EXCITING CAUSES.

1. *Atmospherical agency*.—There can now be no doubt that the Cholera originated in certain districts of India extremely obnoxious to the powerful action of extraordinary atmospherical agencies; nor that its origin was really connected with, and most probably depended upon, the great deviations from the ordinary course of the seasons which we know to have occurred generally in India, for at least three years before the fatal irruption of 1817.* But it may, nevertheless, admit of considerable doubt, whether any atmospherical agency that has ever been experienced even in India, would, of itself, directly and without the intervention of other co-operating causes, be sufficient to generate either *the Cholera*, or any other pestilential disease.† We are inclined to attribute much more to the other natural and more usual effects of irregular and unfavourable seasons, such as, the decomposition of animal and vegetable matter, the failure of crops, and the consequent privation

* Kennedy's History of the Contagious Cholera, p. 12, et seq.

† Mr. Scott observes in his Report, "If the irregularity of the seasons in 1817 and 1818 have given rise to Cholera, we apprehend it can only be in an indirect, and, to us, unknown manner; and its continuance after having originated epidemically, appears to be unconnected in the main with any sensible state of the weather."

and misery of the people, than to the immediate and direct influence exerted upon the human body by the seasons themselves, or by those climatic vicissitudes which characterize them. Nor is this a merely verbal distinction,—but one of moment and weight in appreciating the value of that opinion which does not hesitate to refer a disease so specific and extraordinary as the Cholera, to atmospherical causes actually in operation at the present moment in this country. It has been frequently asked, “Why, as the disease confessedly originated in India from atmospherical causes, may it not also originate in this country from the same causes?” In reply to this question, we have to remark, that it has not by any means been proved that the Cholera was produced, even in India, as the direct and necessary effect of that “war of the elements” which all acknowledge to have taken place. The probability is, as was before hinted at, that for the production of any *pestilence*, other causes must concur; though we can readily believe that when once a contagious disease is generated, its prevalence and extension may be very much influenced and controlled by causes strictly atmospherical. Besides, in order to establish a parallel instance, it remains to be shown that causes similar in nature, and equally powerful in effect, have been in operation in this and other European countries, either before the appearance of the disease, or simultaneously with it; for it seems to us not only unreasonable, but altogether absurd, to believe for one moment that the ordinary vicissitudes of season experienced in this county are capable of generating a disease so new, so peculiar, and heretofore so unheard of, as the Cholera. Else why did it not prevail hundreds of years ago, when circumstances favourable to *malaria*, (one powerful

cause of disease) at all events, were much more numerous and influential than at present? But we have heard it stated, in the belief that it would afford a sufficient answer to our objection, that causes have certainly been in operation in this country, for some years back, in producing a disease characterized by symptoms not very different from those of Cholera.

Now this we confidently deny, as far as our experience extends. We do not mean to assert that gastric symptoms have not prevailed extensively, nor that they have not resulted in a great measure from epidemic causes; but we have never seen cases occurring in this way, at all similar to the disease whose visitation we are now only just relieved from. Whatever may have occurred elsewhere, we have certainly seen no "sporadic cases" of choleric fever in this part of the country; nor can we resist the conviction, that, if it had not yet prevailed amongst us, no one would have been led by the frequency of those slight and dissimilar cases to infer its prevalence in England as even probable, at least as dependent on epidemic causes. Indeed, we have hardly ever heard the argument made use of, without being reminded of the following observations by Dr. Reid:—"So ardently do we desire to find every thing that happens within our observation thus connected with something else, as its cause or occasion, that we are apt to fancy connexions upon the slightest grounds: and this weakness is most remarkable in the ignorant, who know least of the real connexions established in nature. A man meets with an unlucky accident on a certain day of the year; and knowing no other cause of his misfortune, he is apt to conceive something unlucky in that day of the calendar; and if he finds the same connexion hold a second time, is strongly confirmed

in his superstition. I remember, many years ago, a white ox was brought into this country, of so enormous a size, that people came many miles to see it. There happened, some months after, an uncommon fatality among women in child-bearing. Two such uncommon events following one another, gave a suspicion of their connexion, and occasioned a common opinion among the country people, that the white ox was the cause of this fatality.”*

A *second* argument in favour of an epidemic influence has been drawn from the peculiar march of Cholera on a great scale from east to west. Now whatever march the Cholera may be alleged to have taken “on a great scale,” there is such an abundant accumulation of facts to prove that it has obeyed the ordinary laws of contagious diseases, in following the direction of the greatest intercourse, and in pursuing that track in which the greatest number of circumstances occurred to favour the extension of a disease dependent on contagion alone, that the argument, as generally stated, must be considered perfectly futile, and contradicted by all the facts hitherto ascertained upon the subject.

“Much has been said,” observes Dr. Becker, “of the uniform march of Cholera from east to west, or, as some will have it, from south-east to north-west, and it has been attempted to draw an analogy between the progress of this disease and that of the epidemic influenzas which have so often attracted the attention of medical men. Those, however, who are at all familiar with the directions which the Cholera has taken, are aware how little foundation there is for hypotheses of this description. After

* Inquiry into the Human Mind., p. 73., Section IX.

having prevailed in India, the Cholera has spread to the east as well as to the west, to China as well as to Persia, nor has there been even in its western march any sort of regularity or uniformity. The Cholera pays no attention to longitude and latitude, it heeds neither heat nor cold, neither high nor low situations, neither hills nor valleys, seas nor rivers, any further than in as far as these circumstances influence that *one* cause, which seems to direct all its motions, viz., the more or less lively intercourse of men. The disease uniformly follows this intercourse, whether it take place by land or by water, by impetuous armies, slow caravans, or poor pedlars, by ships or small fishing-boats. Wherever this intercourse exists, and in its neighbourhood, the Cholera may appear, and extend its ravages, while it frequently leaves unmolested large districts, which in every respect resemble the country affected by the disease, except in affording no opportunities for frequent intercourse." "Public opinion," says M. de Jonnés, "has continued for fifteen years to point to Jessore as the original place of this pestilence; nevertheless, it has been asserted that it had appeared two months before upon the borders of the Burrampooter, at the eastern extremity of the Indian possessions of Great Britain; it is said that it had already ravaged Nusseerabad at the commencement of June, and in the first days of August it prevailed epidemically at Dacca, as well as in the province of Bahar. On the 11th of July it existed at Patna and Dinapore, which are one hundred leagues north-west of Jessore; and on the 23d of August, it decimated the population of Chittagong, which lies fifty leagues in the opposite direction. * * * * * Before this period (the time of its appearance in Calcutta) it had already become master of Nuddea and Kishna-

gur, on the inferior branch of the Ganges, named the Hooghly; it had invaded Chittagong upon the shore to the west of the bay of Bengal; and it had penetrated to the north as far as Sylhet, which is fifty leagues beyond the Burrampooter. Very soon an area of many thousand miles was subjected to its pernicious influence. It ravaged the towns of Bala-pore, Burrisaul, Burdwan, Rungpore, Malda, Banghulpore, Chupra, and the military stations of Monghyr, Buxar, and Ghazepore. It seemed then to extend itself in all directions, but afterwards it affected to follow particular lines, and to over-run them progressively.* “Starting from the Delta of the Ganges, it extended itself to the south-east, across the Indian ocean as far as the Molucca islands, twelve hundred leagues from the point of its departure. At the same time it was propagated to the south-west, crossing the African sea, to the Isles of France and Bourbon, fourteen hundred leagues from the place of its origin.” It is chiefly the ignorance that so generally and almost necessarily prevails respecting the topography of remote parts of the globe, and consequently the difficulty of ascertaining the routes of the disease, and the circumstances which determined them, that has given to the “north-west passage” its great celebrity. Wherever we have had an opportunity of accurately observing the extension of the disease, whether in this country, or in others, we have seen that it has obeyed the ordinary laws of contagion in following the lines of greatest human intercourse; or if it has in some instances deviated from them, it has been in consequence of barriers opposed to the progress, not of an epidemic, but of a

* Rapport au Conseil Supérieur de Santé sur le Cholera-Morbus Pestilentiel, pp. 167, 168.

contagious disease. The slightest reflection will show that it is not human intercourse alone that is necessary to the extension of contagion. Many other circumstances must co-operate with that. Thus, it is necessary that the intercourse be carried on between infected and healthy places, by persons or goods that have been exposed to the source of the disease ; and that no means of prevention, in the way of quarantine, should have been instituted, or, at all events, that they should have been ineffectual ; that the persons first exposed to them should be in that state of predisposition, which we know to be necessary for the full effect of any contagion, seeing that many persons are being constantly exposed to undoubted contagion, who nevertheless escape, and for no other reason that we can assign, than that they are not predisposed. And perhaps it may be necessary to the wide extension of a contagious disease, that a certain condition of atmosphere should be present likewise, though the influence of this latter over Cholera is probably less than over any other contagious disease with which we are acquainted ; for we have seen it prevail equally in the highest latitudes, and in the regions of the tropics ; in the severest winter, and in the height of summer ; under the equator, where the greatest humidity exists ; and on the sandy deserts of Arabia, the burnt, calcareous plains of Persia, the arid steppes of Little Tartary, and in the highest regions of the atmosphere,—places where we observe the greatest degree of dryness existing on the surface of the globe. It has likewise appeared in places situated, like Catmandoo, (Nepaul,) more than two hundred leagues from the sea-shore, and has overrun countries, as Persia and the Arabian peninsula, which contain neither rivers, stagnant waters, marshes, nor

forests. It cannot depend upon any infection of the air, transported from place to place by the winds; for it is propagated in all seasons, and under the dominion of currents of air the most diverse and opposite. In India, it has travelled in opposition to the monsoons, and contrary to the direction of the regular winds. It has overleaped chains of mountains, which by their elevation arrest the clouds and the winds; but, on the contrary, it is itself arrested by the enclosures of a palace, or the walls of a town, which, however, offer no obstacle to currents of air.*

It has been further argued in favour of an epidemic influence, that the Cholera has appeared in districts, or houses, where no intercourse, direct or indirect, with the sick is known to have taken place. Now, if it be proved by unobjectionable evidence, that the Cholera is propagated by contagion, and if the advocates of epidemia cannot prove, in the cases advanced by them, the impossibility of this principle of contagion having operated in their production, it is humbly conceived that no alternative remains but an acknowledgment that contagion really *may* have produced them. But it is possible that certain facts, apparently of an unanswerable character, may be advanced in support of the opposite opinion; and we confess that there is no argument which we have heard advanced, that to our mind carries with it half the weight and force of the one we are now considering. For although we are morally certain, that the Cholera is propagated by contagion, we cannot say so positively that it may not also originate, *de novo*, from other causes, though we are strongly inclined to doubt the possibility of the fact.

* M. de Jonnés.

All the natural causes of disease to which any importance can be attached, certainly prevailed in much greater force, and to a wider extent, without the production of Cholera, in ages long since passed away, than at the present time, when we are suffering from its deadly ravages. That it cannot depend upon *malaria*, we think too plain and certain to demand serious refutation; for what is the nature of that malaria, or what conceivable origin or existence can it be imagined to possess, which shall equally prevail in the Gangetic Delta, on the top of Mount Ararat, and on the burning and sandy deserts of Arabia; and which after existing in every condition of climate in the world, for fifteen years, finds, on its arrival in this country, a nidus ready for its reception in almost every town and village? At the same time, however, we candidly confess that we have no positive facts,—nothing amounting to demonstrative proof, that the disease may not sometimes originate spontaneously, or from other causes than contagion. The history of the disease, and the greatest body of ascertained facts appear, nevertheless, to negative this idea; while certain instances which have occurred in our practice, in which it was not in our power to ascertain the operation of contagion, leave our mind rather unsettled upon this point, and desirous of further proof. Reasoning from analogy will not at all settle the question, though it certainly makes somewhat against the probability of a spontaneous origin. For if we are not sure that small-pox, measles, scarlet-fever, &c., may be produced *de novo*, how can we imagine a disease so peculiar, so specific, and so truly mysterious as Cholera, to originate in that way? The disease has been said to have occurred at sea in ships having had no communication with the land; but Mr.

Scott, in his report, distinctly states, that "there is no instance on record, of a ship from England having a single case of that disease, until it had communicated with the land; but there are many examples of Cholera appearing on board of ships sailing *from* the continent of India." It is also worthy of remark, that in York no public institution in which the system of exclusion has been rigorously adopted, has sustained any loss in the number of its inmates by death from Cholera. It has been stated, that suspicious cases have occurred in some of them; but the broad fact is certainly unimpeachable, that *no death* from Cholera has occurred in any of them. It ought also to be borne in mind, that whenever Cholera breaks out in a small town, the first case in any locality may generally be distinctly traced to communication, and that it is not until after some time has elapsed, sufficient for the propagation of the disease by contagion to many other parts, that doubts arise as to its real origin. Cases then appear to spring up spontaneously, without intercourse, or any other kind of dependence; but surely we ought not, under circumstances so suspicious, to conclude at once, that because connexion cannot be *traced*, none such has existed. Apply such a test to any one of the diseases acknowledged by all parties to be contagious, and what would be the inevitable result? Why, either that it did not in any case extend by contagion; or, that in some cases it arose independently of it. If such deductions would be unsatisfactory in regard to small-pox, are they not equally so in reference to Cholera?

It has been thought by some, that the sudden origin, progressive developement, and as sudden termination of the disease in infected places, affords

presumptive evidence in favour of the cause of it being epidemic. We have seen that in this city, the first case was a sudden and rather unexpected one; and so were many of the subsequent ones; but they were traceable to each other, and so satisfactorily accounted for: but it might have happened that no connexion could have been discovered, and then we should have been told that the disease had plainly originated spontaneously in all these instances, and, to strengthen that opinion, analogies the most remote and inapplicable would have been adduced. We should have been referred to the number of cases of gastric affections that occurred about that time twelve-months, though what would have been of infinitely more importance, could it have been established, viz., that such cases were prevailing at the time, or just before, the Cholera appeared amongst us,—was so contrary to every man's experience, that it was found impossible to lay hold of it, even as a coincidence; and though such an accident, (for such only could we regard it,) had it occurred, would have been considered very strong evidence of an "epidemic influence," we are now told that the absence of it is equally to the point, for the suddenness of the first cases shows they were dependent upon some equally sudden change in the condition of the atmosphere, though what that change consists in, or how its existence is to be ascertained, we are not informed. With regard to the development of the disease, we think no one can have observed its infinite variations without being convinced, that it cannot possibly depend on any condition of the atmosphere alone; and though we do not attempt to explain how it is that one day we have twenty cases, and the next only five, still, we regard the facts as they occur, to be quite as conclusive in favour of

contagion, as of any other cause. How it has come to pass that the termination of the disease has usually been said to be sudden, we are at a loss to know; for a reference to the reports will almost invariably show the contrary,—that the disease has declined gradually, slowly, and irregularly. The duration of the disease in any town also seems to bear some proportion to its size, number of inhabitants, &c., &c.; thus, we see that in small towns, in which the intercourse of the people is easy and constant, the disease soon declines; in larger places, where the general intercourse is slow, but the local considerable, it extends rapidly in places, but requires a long time to become general; and in still larger towns, it may exist, in successive parts of them, for an almost indefinite period. Now all this is easily accounted for, on the supposition that the disease is transmissible from person to person, but seems quite at variance with the idea of an unhealthy condition of atmosphere existing generally in any town; for then we ought to have a great number of simultaneous attacks in every part of it; and when it declines in one locality, it ought equally to disappear in all.

It has been further argued, that the great numbers of persons having intercourse with the sick, especially medical men and nurses, who nevertheless escape with impunity, is a powerful argument against contagion, and in favour of an epidemic cause. Now, in discussing the merits of this argument, it is right to begin with stating, that no number of exceptions to the operation of contagion can, unless, indeed, they be universal, invalidate the proof afforded by a single unequivocal case that has been produced by contagion. The number of exceptions, if we suppose them to be greater than in other strictly contagious diseases, which, however, we very much doubt, could

do nothing more than indicate an important law in the propagation of the disease, as requiring other conditions than contagion. They could not disprove the fact, that in some instances the disease is communicated by contagion; they could only show, that persons in good health, or under favourable circumstances, the precise nature of which is yet to be ascertained, may sustain all the necessary relations with the sick, with the probability of themselves escaping from infection; an arrangement no doubt allowed by the all-wise Disposer of events, to ensure attention to the discharge of those necessary duties of humanity so incumbent upon all rightly constituted minds. But suppose we were to retort, that it is quite impossible the disease can be dependent on local epidemic causes, inasmuch as most of the persons exposed to their influence are not affected by them so as to become the subjects of the disease; would there be in this any more of absurdity and contradiction, than to affirm that contagion does not operate, because all are not affected by it within the range of its extension? We might thus reason ourselves out of the belief of all secondary causes whatever, and reduce ourselves to the only alternative of supposing the instances of the disease to be direct inflictions from heaven, without the intervention of any instrumental agency. "Medical men," as has been well observed by Dr. Hawkins,* "may sometimes doubt the contagious power of a disease, because it has not affected themselves; but this is far from being a conclusive argument. The long habit of attending the sick may probably render the constitution less susceptible of contagion, as it

* History of the Epidemic Spasmodic Cholera, p. 155.

does of most other noxious impressions ; the confidence engendered by long security, and by superior knowledge of the means of preserving health, may exert also a *moral* defence, which has at all times been found most efficacious against the attack of epidemics."

But is it true that so few of the medical men, and hospital, or other assistants, have been attacked, as to warrant the assumption contained in the objection ? Let us see what has occurred in India, on the Continent of Europe, and in this country.

"On the 10th of July, 1819," says Dr. Daun, "after having been for several hours in close attendance on a patient labouring under the epidemic Cholera, I was threatened with an attack ; but it was happily warded off. On the morning of the 11th of July, two more cases of the epidemic were admitted into the hospital, and as I had not sufficiently recovered, they were attended by my assistant, Mr. Gray, until the afternoon, when I was again able to give him my assistance. Mr. Gray was himself seized with the epidemic in the night following, and the attack was so violent, that at one time his life was quite despaired of. Mr. Gray was attended during his illness by two officers, his most intimate friends, both of whom had severe attacks after a lapse of a few days.

"A corporal, who always attended the sick from the barracks to the hospital, was about the same time attacked, and died. The same fate befell the soldier who was employed as hospital orderly. My hospital servant had a most severe attack, and had very nearly fallen a victim to it ; and one of the half-caste lads attached to the regiment by Government, as a medical pupil, had also an attack, but a very

mild one in comparison with the others.”* Dr. Burrell writes from Seroor, July 27th, 1818, “I am cautious in reporting the Cholera not infectious: almost every attendant in the hospital, during the short space of six days, has had the complaint; and there are about thirty attendants attached to the establishment. The regiment is about eight hundred strong. The admissions from the regiment bear no proportion to the number of attendants who have been taken sick.” Mr. Train writes, “Several circumstances have occurred during the attacks at this station, (Ghooty,) tending to prove the disease contagious. Great numbers of men who have been waiting on their sick friends, were lately attacked. It has generally happened that one person in a family having been seized, others in the same house have afterwards almost immediately sickened.” “Orderly sepoy,” says Mr. Kellie, “attending on the sick, were so generally attacked, that their attendance came to be enforced with difficulty. When it appeared in a family, it usually happened that several of its members were seized.”

Many other instances of a similar nature to those already quoted, might be produced from the Indian Reports; but these are sufficient to show that even in India, where circumstances of this kind were less frequently observed than elsewhere, many instances have occurred in which the attendants upon the sick have been attacked out of all proportion to others not so situated. Very numerous authorities, however, might easily be quoted from the same reports, to prove that in many places, and under various cir-

* Extract from the Report of the Eighty-ninth Regiment, at Quilon, in Travancore, on Spas. Chol.

cumstances, the attendants have not been attacked to any great amount; and in some few, not at all. What are the conditions determining these different results, has not been ascertained. "In the hospital at Thorne, (West Prussia,)" says Dr. Becker, "ten attendants were taken ill during the prevalence of Cholera, and seven died; at Mewe, four attendants and the grave-digger were seized; at Breslau, one of the very first Cholera patients was received into the hospital of the *Fratres Misericordiæ*, and three of these charitable monks were taken ill immediately afterwards. In Berlin, the Cholera Hospital, No. 2, had ten male and female attendants, and three medical assistants: of this number, six attendants and two assistants took the Cholera within three weeks. Of the state of health in the Cholera Hospital, No. 1, I have received the following details from my friend, Dr. Romberg, Physician to that institution:—"Within the first four days after the hospital was opened, both my assistants were taken ill: one of them had diarrhœa, oppression and anxiety, and pains in the calves of the legs; he recovered quickly upon taking an emetic: the other, having one evening taken a supper of cabbage and hot red wine, was seized with oppression, diarrhœa, and a drawing pain in the calves of the legs and in the fingers: it was found necessary to bleed him; he also took an emetic, and recovered. The next patients were two of my nurses, both of them with confirmed Cholera: one of them recovered, the other died in a late stage of the disease, with the cerebral affection so often observed. Then two men, employed in carrying patients and dead bodies, took regular Cholera: one of them also recovered, and one died. The following patients from the house were,—a washerwoman, who recovered; a male attendant, who recovered; and

the hospital superintendent. Besides these persons, who were reported on the sick-list and regularly treated, a considerable number of individuals connected with the hospital-service (thirty-five out of a total number of seventy or eighty) occasionally complained of diarrhœa, vomiting, and drawing pains in the extremities, but soon recovered by using good diet, and simple remedies.' Dr. Romberg himself was afterwards attacked with premonitory symptoms; but these on the fourth day yielded to an attack of the gout." The facts collected in Petersburg appear quite decisive, and are amply confirmatory of the risk of infection sustained by the attendants upon the sick, as will be seen from the following statement:—

1. *In the Merchants' Hospital.*—Attacked, one purveyor, two barber-surgeons, four servants; one dead.

2. *Hospital of the Semenoffsky Regiment.*—Attacked, three barber-surgeons, seven servants; two dead.

3. *Aboucoff Summer Hospital.*—Attacked, eight servants; three dead.

4. *Cholera Hospital at the School for the Sons of the Clergy.*—Eight servants employed; two attacked.

5. *Hemp Merchants' Hospital.*—Twelve servants employed; three attacked; two dead.

6. *General Military Hospital, Vibourg quarters.*—Physicians, three attacked, one dead. Servants, twelve attacked, four dead. Of twelve medical students employed, *pro tempore*, all had diarrhœa, and other slight symptoms.

7. *Cholera Hospital of the Foundling Hospital.*—Of forty-two attendants, fifteen were attacked, four barber-surgeons included, of whom three were attacked.

8. *Hospital for the Imperial Stables.*—Seven servants employed, three attacked.

9. *Rogistevensky Hospital*.—Physicians, five, and all the attendants of every description attacked.

10. Of two hundred and sixty-four Physicians, the whole number in St. Petersburg during the epidemic, above forty were attacked by Cholera, of whom nineteen died.

In the Naval Cholera Hospital, however, Dr. Seidlitz states, that of forty-two attendants, (two Physicians,) none were attacked. This hospital is composed of two detached buildings, standing in the middle of a field about two hundred yards square, perfectly ventilated, and unembarrassed by other buildings on any side.*

With regard to what has occurred generally in this country among the attendants upon the sick, it is not possible at present to state very accurate results, because in most places no report has been published from which the requisite information can be obtained. We may remark, however, that numerous instances have everywhere been recorded of the disease having prevailed, to a considerable extent, among those persons whose duty it has been to attend the sick in the capacity of nurses, and among washerwomen, white-washers, friends, relatives, and, in not a few instances, medical men, whose respective duties have brought them into contact either with infected persons, clothes, or houses. Dr. Brown, of Sunderland, from a review of all that he had ascertained upon the subject, draws the following among other conclusions:—"Within the district which it occupies, it possesses a contagious property; or, in other words, those individuals who have intercourse with the sick, especially in a locally impure atmosphere, are attacked in greater proportion than

* Vide Med. Gaz., Vol. X., p. 31.

other members of the community." In the account of what occurred in Coldbath-fields Prison, Dr. Stevens states, "It had been ascertained that washing the blankets, &c., was a most dangerous occupation; for out of fourteen individuals who were employed in this service, ten were attacked with Cholera; almost all of them had the disease in its most malignant form, and four of them died."*

The instances of this kind, if accurately collected in all the places where Cholera has prevailed in this country, would, we doubt not, present a body of evidence the most conclusive and irresistible; and we are confirmed in this belief, as well by those cases which have been reported by others, as by what has occurred under our own observation.

It has been already shown, that in this city, the persons who suffered were generally those who had intercourse with the sick, as nurses, friends, &c., &c. Many of the white-washers have been attacked with premonitory symptoms while engaged in cleaning infected houses. Of the two men who were so employed at the Workhouse, both were successively so indisposed by sickness and purging, as to be compelled to desist from their work; and other persons of the same employment have died of the disease. Of the two nurses, one was obliged to retire in consequence of premonitory symptoms, though it is right to state, that she had previously sustained great alarm at the awfully sudden seizure and death of one of the inmates. Many of the medical men have experienced very anomalous feelings of "malaise," during their attendance on Cholera patients, and some of them have suffered from diarrhœa, cramp, &c. We were personally attacked with diarrhœa, which continued

* Med. Gaz., Vol. X., p. 659.

for four successive mornings, and required the exhibition, each day, of a dose of laudanum; and the whole of our family, consisting of five persons, were similarly, and even more severely, affected. And, though no death has occurred in the profession here, it would be presumptuous to affirm that such would still have been the case, though no precautionary measures had been employed. No instance of the communication of the disease to any of the attendants at the Cholera Hospital has been observed;—but it is necessary to state, that the house is isolated, thoroughly ventilated, and the nurses and other attendants enjoined to live well. But it has been very different with the nurses in private houses; many of them having been attacked, and died.

We consider that the facts and reasonings already adduced, notwithstanding their imperfections, go far to prove that the Cholera is not originated and extended by any condition of the atmosphere, nor by any modification of malaria; for we have seen it prevail under every possible state of the former, and in places where the operation of the latter was quite out of the question. We shall conclude this part of our inquiry in the words of M. Moreau de Jonnés, as more striking and appropriate than any we could hope to employ: “The negative propositions established by these facts prove incontestably, that the Cholera does not at all follow the laws of epidemics, the cause of which resides in some intemperature, in a vitiated air, or in some locality. It has evidently no relation to that kind of disease, either in its origin, extension, march, or progress. It does not result from any fog, vapour, or miasm, floating in the atmosphere and carried by the winds. It is not produced, either by excess of heat, or by extreme

humidity; either by the absence of the electrical fluid, or by any other of the great physical agents whose operation determines the influence of climate. It cannot but belong necessarily, then, to that class of formidable diseases which originate in a principle *sui generis*, in a germ, the intimate nature of which is unknown, but which possesses the power of developing and reproducing itself, like organized bodies, under special conditions, and which is propagated by transmission, mediate or immediate, from one individual who is sick, to another who is healthy. In a word, it is not an epidemic, as malaria, but a contagion, as the plague of the East.”*

II.—*Contagion.* We fully concur in the opinion expressed by a most able and lamented physician, that the contagious or non-contagious nature of a disease ought not to be made a question of inference to be determined by reasoning, but a question of fact to be determined by experience. Nevertheless, it is quite possible to have an abundant and overwhelming accumulation of facts, without being convinced by them, but which, when properly connected, and fully developed, by accurate deductions, are instantly conveyed to the mind in all the truth and force of sensible and visible representations. The fault we have to find with the anti-contagionists is not that they shut their eyes to facts, and neglect reasoning, but that they reject the greatest number of well authenticated facts, and amuse themselves with others not fully ascertained, or from their infrequency, or doubtfulness, objectionable. Thus they seize with avidity upon such an instance as Paris, where, they say, the disease not only broke out suddenly, but in so many

* Rapport, &c., p. 121.

different parts of it at the same time, and in a few days numbered so many victims to its virulence, as are quite incompatible with the supposition of the sole agency of contagion; and they exultingly demand of the advocates for contagion to explain all these anomalies upon that doctrine, forgetting, or not choosing to refer to the fact, that even until now, all the circumstances of that calamity have not been made known with sufficient accuracy, to warrant a very decided opinion, either one way or the other. Besides, it is often quite impossible to detect the mode of introduction into a place, and especially into a large city, of a disease allowed to be contagious by all parties; and yet that circumstance alone does not at all affect the question of its contagiousness, especially if facts should be afterwards observed in its extension which plainly establish the agency of that principle. Now, it will readily be allowed by all persons, that, however the disease might have been introduced into the French capital, no restrictions at all likely to check its progress were observed; but, on the contrary, every facility was allowed for its propagation among all classes of the community. For not only were cases of the disease received into the hospitals,* containing other patients, but persons of all ranks from every part of the city were allowed free intercourse with them: how many did visit them, cannot of course be ascertained; but the number is known to have been very great. The general

* J'avais déjà vu les premiers malades envoyés à l' Hotel-Dieu ; et je n'oublierai jamais le lugubre spectaele qu' offraient à nos yeux étonnés les salles de ce grand hôpital, dans lesquelles furent placés les cholériques admis pendant les journées des 28 et 29 Mars." *Traité Pratique, Théorique, et Statistique, du Cholera-Morbus de Paris.* Par J. Bouillaud.

use of public privies, the bad drainage of the city, and the narrow, confined, ill-ventilated streets, would also favour the extension of a contagious disease. Many of the patients in the hospitals, ill of other diseases, are known to have died of Cholera, after the introduction of Cholera patients; and a great number of nurses, medical men, and students, fell victims to it, probably from the same cause. A great number of washerwomen also sustained attacks, but the proportion has not been ascertained.

We think it by no means unlikely, though we do not insist upon it as an ascertained fact, that the Cholera was conveyed to Paris by some infected person from London, where the disease had prevailed for six weeks before its appearance in the French capital. On this subject, however, we would content ourselves by referring to the very sensible letter of Mr. Orton, contained in the last volume of the Medical Gazette. The following account of the progress of the disease is just such as we should expect to receive, on the supposition of its contagious nature, after knowing the above facts: “Pendant la première semaine de son règne, le fléau cholérique parut sévir exclusivement sur la classe pauvre de la capitale, et ce fut dans l’un des quartiers les plus malsains de la ville qu’elle exerça sur-tout ses ravages (le quartier de l’Hotel-de-Ville et la rue de la Mortellerie en particulier). *Peu-à-pen, les quartiers les plus sains de la capitale furent eux-mêmes envahis, et les classes riches devinrent aussi la proie de l’épidémie.* Toutefois, conformément à ce que nous avons dit plus haut de l’influence de l’encombrement et de l’altération de l’air, c’est dans les rues les plus étroites et dans les maisons de ces rues les plus insalubres, que, toutes choses égales d’ailleurs, le fléau a sévi avec le plus de rigueur.

Le mouvement de la maladie a été donné avec trop de détails par les journaux politiques et médicaux, pour qu'il soit nécessaire d'insister plus longuement sur ce point de l'étude générale du Choléra de Paris. Qu'il me suffise de dire qu'au moment où j'écris (derniers jours de juin, troisième mois de l'épidémie) plus de trente mille habitants de Paris ont payé leur tribut à la maladie, et que le nombre des personnes qui ont succumbé s'élève, suivant le chiffre officiel, à près de quinze mille."* We are not aware that any irruption of the Cholera has occurred under circumstances which rendered its introduction by infected persons or goods impossible, or even very highly improbable; while, on the other hand, so many instances are known of its appearance immediately after ascertained or highly suspicious circumstances, connected with its prevalence in other places, that we cannot doubt that its origin generally is to be fairly attributed to contagion. We have seen that the first case in this city occurred in a young man, who, for three days previously, had been employed in ferrying across the water persons from infected towns; and that some of the earliest cases in another part of the city occurred among vagrants and the keepers of lodging-houses. Coincidences (to say the least of them) of this kind have been so often observed, that if the disease had been *Plague*, instead of *Cholera*, no person would have doubted the mode of its introduction.

In the discussion which follows, we shall endeavour to produce many instances of the positive introduction of the disease into places, previously healthy, by infected persons or goods; and also to show, that, after its appearance in any town, its further progress

* Bouillaud, *Traité*, &c., p. 193, 194.

into new districts of that town has been clearly coincident with, and dependent upon, the intercourse between the sick and the healthy; and, lastly, we shall show that those places which have been effectually insulated have escaped the disease, while it prevailed all around them.

The *Topaze* frigate left Ceylon, where the disease was prevailing, for Port-Louis, in the Mauritius, where she arrived on the 29th of October, 1819. During the voyage the Cholera broke out among the crew, and several of them died. Three weeks after the convalescents from the frigate were landed, the Cholera attacked the inhabitants of Port-Louis, and carried off fifty or sixty daily. The *lowest* estimate of the mortality amounts to 7000, or a twelfth of the whole population. Before the arrival of the *Topaze*, the public health of the Colony was excellent; for it is one of the most healthy of the islands of the tropics. From time immemorial, it had not experienced any contagious disease.

The Isle of Bourbon, situated forty leagues from the Isle of France, was exposed by its proximity, and constant communication, to receive the germs of the Cholera. Baron Milius, the French governor, established the strictest quarantine regulations, immediately on hearing the fate of the Isle of France; and for two months they were successful. In spite of these precautions, we have the authority of the Madras Gazette, June 8th, 1820, and the correspondence of the governor Milius himself, for stating that a smuggling vessel, named the *Pic-Var*, which sailed on the 7th of January from the Isle of France, landed a cargo of slaves near the town of St. Denis, in the Isle of Bourbon. On the 14th of the same month, eight slaves perished in that town. This was

a signal for the inhabitants to quit the spot. The governor instantly established a lazaret for the reception of the sick, and a double military cordon to prevent communication with the interior of the country. The result of these precautions was, that two hundred and fifty-six individuals only were attacked, one hundred and seventy-eight of whom died. It is impossible not to be struck by the contrast, when we compare the mortality in the English with that in the French colony, placed under precisely the same circumstances in all things save the wisdom and energy of its authorities. In the Mauritius, one in four, according to the general belief, or one in twelve, according to the governor, of the whole population perished; while, in the Isle of Bourbon, only one in fifteen hundred died.* The disease has been introduced into a great number of other places by precisely similar importations. Thus, in the month of August, 1818, it was imported into the island of Bombay, by the boats which constantly traverse the canal separating that island from the main-land, where the disease reigned with great violence, especially at the village of Panwell, the place of embarkation; in January, 1819, into the island of Ceylon, by the communications of Colombo and Jaffnapatam with Palmacottah, a town on the other side of the straits, at the extremity of the Indian peninsula, and where the Cholera was then raging;—in 1819, into the island of Sumatra, by the numerous embarkations which, crossing the Straits of Malacca, came from the town of that name, from whence they carried the disease into the port of Achem;—in October, 1819,

* See Moreau de Jonnés, p. 131; and Quarterly Review, Nov., 1831.

into Penang and Singapore, where it was carried by the ships from Malacca;—in 1820, into Bangkok, the capital of the kingdom of Siam, by the vessels of commerce from British India, which conveyed their goods up the river to that town;—in 1820, into Canton, and in 1823, into Macao: the same means afterwards spread the disease through the Chinese empire;—in 1821, into Java, where it was carried by the trading junks from Samarang;—in 1820, to Manilla, where it was imported by ships from infected places;—in 1823, to the Moluccas, where the disease was imported by the Dutch ships from Calcutta.

“We know that Bombay, and the western coast of India, were infected in 1821; that vessels from the various ports in it touched at the islands of Ormuz, Kishmé, at Bender Abouschir, Muscat, and Bassorah; and we also know, that at all those places in the Persian Gulf, the Cholera broke out in 1821. Further, we know that caravans, which received Indian goods at the above ports, travelled through Arabia, Mesopotamia, Persia, and Syria, and that Cholera followed their various tracks, and appeared immediately after their arrival in places where they rested.” *

In 1823, the Russian flotilla in the Caspian Sea received the Cholera by its communications with the ports of the Persian provinces, where it then raged, and transmitted it to the population of Astrachan, the first European town which was desolated by it.

Lastly, during the irruption of the pestilence in 1830, in the Russian empire, it was ascertained to have been imported into the following places:—

Into Astrachan, on the 20th of July, by a ship from

* Quarterly Review, p. 196.

Bacou, on board of which eight men had died of the disease during the voyage.

Into Nicolaoſſ, by a ſhip from Suchumkali: eight men belonging to this veſſel were attacked by the diſeaſe.

Into Kertz, by ſhips from the ſea of Azoff, on the ſhores of which the diſeaſe had prevailed above a month.

Into Sebaſtopol and Odessa, by Ruſſian ſhips of war, which had touched at Kertz and other infected ports.

Into the numerous towns ſituated on the two banks of the Volga, and which received the contagion ſucceſſively, in the months of Auguſt and September, by the barks from Aſtrachan.

As the Ruſſian armies marched into Poland from the infected governments of Konrok and Cherkoff, the towns on their route became ſucceſſively affected. Kieſ, Braſlaf, Ramenetz, Taſtaf, Lutz, were attacked; the malady thence penetrated into Poland by Lublin, and reached Waſaw. The Poliſh government ſtate, in their circular, Jan. 1, 1831, “that whenever the two armies met, Cholera was ſure to attack the Poliſh troops. This was the caſe immediately after the battle of Oſtrolenka.”

Very many other inſtances, preciſely ſimilar, of the appearance of the diſeaſe in places previously healthy, immediately after the arrival of infected perſons or goods, might be adduced; but the above are amply ſufficient to eſtabliſh the mode in which the diſeaſe has uſually been propagated. It is ſingular, and extremely important to notice, that many of the places already named were not only free from Cholera before its importation by the means ſpecified, but alſo from every other epidemic or contagious diſ-

ease. Thus, it is stated by Moreau de Jonnés, that from time immemorial the Isle of France had not experienced any contagious disease whatever; and the same is remarked by Dr. Macleod, of the Philippine Islands: "Up to the time of the introduction of the Cholera, no epidemic or contagious disease had existed in them." There is great reason to believe, though the fact has not been demonstrated, that the Cholera was really imported by ship from the Baltic, into Sunderland, the place of its first appearance in this country. "If, then," says Mr. Ainsworth, "quarantine regulations have been really useful in warding off the new disease, as they have been found by the experience of ages to be with regard to other infectious disorders, it must be expected that the present malady will have shown itself where these laws have been neglected or infringed, or where local circumstances prevented their successful adoption. To this last fact alone I attribute the breaking out of the disease in Sunderland; and it will be easy to show, that natural obstacles lay in the way of any effectual quarantine on the Wear, which do not exist to a similar extent in any other place admitted as fit for the performance of a rigorous quarantine. These difficulties were afterwards attempted to be obviated, but even then with doubtful success; and thus the disease might have a foreign origin, though not capable of being traced to a ship, yet beginning with a sailor employed on the river, and exposed, with others, to the immediate contact of numerous vessels coming from infected parts."* Again, in a letter to the Editor of the Medical Gazette, Mr. Geenhow, of North-Shields, says, "All the little towns and villages

* Observations on the Pestilential Cholera, pp, 14, 15.

round about us are suffering under a great mortality, owing to the unrestricted admission of mendicants and vagrants.' Dennis M'Gwin, who took the disease to North-Shields, came from Sunderland. The first case in South-Shields was a boy from Gateshead. A pedlar woman took it to Houghton; a traveller to Morpeth; and I have no doubt its arrival could similarly be traced to Durham, Haddington, and Trarant, all towns upon the same high-road."*

One of the most unexceptionable accounts of the introduction of the disease into a town, previously remarkably healthy, is that furnished by Dr. Douglas, of Hawick; to which place the disease was almost certainly conveyed by a cattle dealer who had been at an inn at Morpeth, where, shortly after his arrival, a traveller was attacked with Cholera, and died.† Very similar were the circumstances attending the irruption of the disease at Hutton-Rudby, a village in the neighbourhood of Stokesley. A man residing in the village, by trade a weaver, but out of work, set off to Newcastle, in search of employment, and after remaining there some time, returned to his former residence. On the way home he was attacked with symptoms of Cholera, and died soon after his arrival at his own house. Though the village is remarkably clean, and was previously very healthy, yet, in consequence of no sufficient precautions having been immediately taken to prevent the extension of the disease, in the course of a few days thirty persons were attacked, thirteen of whom died. Every one of the earlier cases could be satisfactorily traced to the operation of contagion. We have seen that in those villages near York, in which the

* Observations on the Pestilential Cholera, pp. 163, 164.

† See Cholera Gazette, No. VI., p. 233—248.

disease has appeared, it was introduced by persons who had come from infected parts; and all those other villages which have hitherto escaped the disease, owe probably their exemption to the adoption of a rigorous system of *inclusion*, which we are assured was most strictly enforced upon the inhabitants.

We now come to the second part of our proposed task, — to show that when the disease has once appeared in any place, its progress into new districts is dependent on the intercourse between the sick and the healthy. Although the first case of the disease in this city occurred on the 2d of June, it was not till about the 15th that other parts of the city than those already named, became affected. Up to that time, the disease was confined to the parts into which it was first introduced, or clearly ascertained to have been afterwards conveyed by communication with the sick. Thus, not a single case of Cholera occurred in the district to which we were appointed, (though it will be acknowledged by all to contain as great a number of proper subjects for the disease, as any other in the city,) till the 18th of June; and, in all probability, the disease would not have reached us then, had there been no communication with the sick. Our first patient was a man who had been to visit his brother, who was ill in Cholera in another part of the city, and who died a few days afterwards. In the other parts of our district, it did not appear till the 24th of the month. No case had occurred, we believe, up to about the 15th, under circumstances in which contagion could not be either distinctly traced, or fairly presumed to have operated. But afterwards, that is to say, when the disease had been prevailing amongst us nearly a fortnight, other

streets became affected, and some of the persons attacked could not be ascertained to have had any kind of communication with the sick, and, in fact, the possibility of their *direct* communication will not be contended for. But what is the just inference? Are we to suppose that no sufficient exposure could possibly be incurred, because none could be clearly traced; or, should we not rather acknowledge that many causes would conspire to extend the disease by contagion, which, from their very nature, were not likely to be much dreaded, or, at all events, not carefully and completely avoided? Now, we think that no person who argues against the contagiousness of Cholera, can account for its being confined so long to the localities into which it was first introduced, on any other rational supposition. Is there any such predilection for one particular part of a town, and that, in some cases, comparatively healthy, shown by any other of our strictly epidemical diseases; especially, when other places abounding much more in malaria, and other noxious agents, are so near at hand, and so freely accessible to it? If the disease were really caused by some peculiar, unknown condition of atmosphere, independently of contagion, why did it not attack simultaneously persons residing in every part of the city? why does it require a period of thirteen or fourteen days, to extend itself to the districts not first attacked? and how is it that those parts in which, *a priori*, every one would have expected its appearance at the very onset, have not to this moment experienced its ravages? We remember hearing it remarked by persons who went from York to observe the disease at Goole, Hull, and other towns, that for a considerable time after its first outbreak, its ravages were confined almost, if not entirely,

to certain localities ; but that afterwards it spread in every direction. Now, all this is easily explained by the doctrine of contagion, because it is all in strict accordance with the known laws of contagion. But how can it possibly be accounted for on the supposition that the cause is so general as to affect the atmosphere of a whole town, seeing that only a few of the inhabitants in certain localities, entirely exempt from malaria, are affected by it ? The same difficulties to the admission of an "epidemic influence," as the efficient cause of the propagation of Cholera, have been experienced in many other places ; but we will only avail ourselves of the particulars of one of them, viz., Berlin, so ably and minutely detailed by Dr. Becker, in his letter already so often referred to : " 1. The disease having evidently been imported by the navigation on the Fienow canal and Havel, one skipper coming from an infected district having died in his boat at Charlottenburg, on the 29th of August, and another also in his boat at Berlin, on the 30th, various other cases now occurred in the *boats*, and in the *streets in the immediate neighbourhood of the navigated part of the river*, inhabited by persons who had intercourse with the shipping. These streets extend through the whole breadth of the town, and part of them form one of the most populous districts. On all parts of this line cases of Cholera occurred on the 31st of August, 1st, 2d, and 3d of September, and the following days ; and in some of these streets the disease committed great ravages. Thus, on the *Schiffbauerdamm*, a quay in an open situation, where the boats loaded with wood are unloaded, six cases are reported in the month of September in boats, and twenty-six cases in ten out of the twenty-eight houses forming the street. Higher

up, in the district where the sale of fish and fruit goes on, we find on each side of the river a row of houses: one of them, on the north-east side, (*Schleuse*), consists of shops and small habitations of the lower classes. No. 4 of this row had the first Cholera case that occurred in *any* house in Berlin; and the disease successively showed itself in the houses 2, 5, 11, 12, 14, and 15, in which twelve cases are *reported* (I know the real number to have been greater) within twenty days; no new case having been recorded after the 19th of September, for several weeks. The row on the opposite side, (*Wasserstrasse*), well known to be cold and damp, but occupied by inhabitants who have no intercourse with the skippers, remained without a single case of Cholera; but the disease spread considerably to several small streets and alleys situated *behind* this *Wasserstrasse*, and consequently at a greater distance from the river, but occupied by the lower orders. The continuation of the *Schleuse* is the *Friedrichsgracht*, which, extending in the shape of an inverted crescent, is, along with the *Fischerbrücke*, surrounded by the river, here filled with fishing boats and other small craft, and wells for fish. These and the neighbouring streets, *Fischerstrasse*, *Petristrasse*, *Ross-strasse*, *Mühlendamm*, were also, from the very first days, infected by the Cholera: the whole district is thickly inhabited, chiefly by persons of the lower classes, whose business leads them to frequent intercourse with the river. Up to the 1st of October I find forty-eight houses in this district marked as having had seventy-three Cholera patients.

“2. The Cholera was not observed *in any other part of the city of Berlin for four days* after it had shown itself in the districts now mentioned; which is the more deserving of attention, as various other parts

are situated equally low, and intersected by canals of the river Spree, but not navigated.

“3. The first case which occurred at a distance from the river (No. 16 of the Cholera list) was that of a person who had worked at the mint, (close to the river, and opposite to the *Schleuse*,) and who was seized on the 3d of September, at his house in the *Kaiserstrasse*, a dry, airy, elevated street in the eastern suburbs. Between the 3d and the 22d of September five other cases of Cholera were reported from three different houses in this same street.

“4. The second case reported from a situation removed from the river, happened on the same day, (Sept. 3d,) in the Workhouse, a large building, containing about 700 inhabitants of the lowest classes, who there find employment. During the month of September fifty-seven persons were taken ill of Cholera in this house. Another building situated close to the Workhouse, inhabited by about 550 persons of the same description, had thirty-six patients, the first of whom, however, was not reported till September 8th, *five days after the appearance of the disease in the neighbouring Workhouse*: the two buildings being exposed to precisely the same atmospheric and terrestrial influences, and the mode of living of the inhabitants being also identical.

“5. The disease now successively showed itself in other districts, particularly in many of the close streets in the central parts of the city, and in those streets in the northern and eastern suburbs, which are chiefly inhabited by labourers. It was long in reaching some of these districts, but having once appeared, extended in them with as great intensity as in the neighbourhood of the river.

“ Thus, in the fifty-eighth district, which is *extra muros*, and at a great distance from the river, but inhabited by labourers, Dr. Oppert observed the first case of Cholera on the 10th of September, *the disease having then been twelve days in Berlin*. The patient died on the 14th; on which day his landlord, who had shaved him during his illness, and a woman who lived next door to him, were taken ill, and also died. Three days afterwards, a fourth person died in the same house; and *seven houses in the same street* were now successively attacked.

“ The fifty-ninth district includes four large houses, in which about 2000 or 3000 inhabitants, the most wretched of the population of Berlin, live, crowded together in a deplorable manner, sometimes several families in one room. These houses, (commonly called *family-houses*,) built by an avaricious speculator, are universally considered as our greatest general nuisance. On this occasion some curiosity was entertained how the Cholera would treat them. Those who ascribe the disease to the influence of the river, expected them to remain free, because they are far from the water; those who seek the miasma in the air, and believe it to act on those who are exposed to cold, want, and intemperance, presumed that these houses were to suffer immediately. Neither expectation was fulfilled: the *family-houses remained free of Cholera for three weeks*; but between the 21st of September and the 15th of October, *between forty and fifty cases* occurred in them.

“ In *ten* rooms more than one case happened; and, according to the report of Dr. Thümmel, these recurrences were almost exclusively found, where the first case was not removed till dead, or dying. The comparatively small total number of cases in this

very unfavourable situation is in great part to be ascribed to the activity of the gentleman just named, who caused the patients to be removed, as soon as notice was given, to an appropriate hospital.

“6. Other districts have remained remarkably free of Cholera down to the present day. Thus the streets near the Hallegate, which lie in the neighbourhood of a canal, and so low that the cellars are every winter filled with water, have scarcely had any disease. One of these streets (Wilhelmstrasse) is in part inhabited by very poor weavers, whose dwellings can by no means be regarded as healthy; still they have not suffered from Cholera. But they live far from the river, and their secluded mode of life does not lead them to mix with the inhabitants of the infected districts.

“7. In the greater part of the west end of the town, (Friedrichstadt,) solitary cases of Cholera have occurred, principally in the few houses occupied by the poor, in this district, which is chiefly inhabited by the better classes. In many instances, it has been easy to trace the origin of these cases to communications which the patients had had with the infected districts, particularly with the shipping.

“8. The district of the committee of which I am a member, (No. 13,) comprehending 5000 inhabitants, in what may be termed the best part of the town, has, till now, been, above all others, fortunate in having little Cholera. From September 4th to November 4th, only *six cases* occurred in private houses, and *five among the attendants* of an institution founded for the relief of the patients of this district. It is a remarkable fact that, this institution occupying two small houses, Kanonierstrasse, 33 and 34, two out of the above six cases occurred in the same

street, Nos. 32 and 35, the contiguous houses; one of the patients being a lodger of the nurse of the institution.”*

We now proceed to the last division of this part of our subject, viz., to show that when persons or places have been effectually insulated from the sick, they have escaped the disease, while it prevailed all around them.

From 1822 to 1824, the Cholera, which had been introduced into Syria by the caravans, ravaged that country, following all the lines of communication. When it was established in Judea and in the province of Damascus, it threatened very soon to penetrate into Egypt, by some of the numerous relations of those countries with it, and by the route of El-Arisch, or by the ports of Rosetta and Alexandria. But at this epoch, the viceroy, having consulted France upon the measures to be adopted for delivering the country subject to his authority from the plague, that occasion allowed the supreme board of health to address to him instructions for preventing the introduction of Cholera into Egypt. In consequence, a strict “surveillance” was exercised over the ships coming from the coast of Syria, and the caravans arriving by the Isthmus of Suez; and those measures were attended with the most complete success. In Persia, when the malady was attacking the large towns on the high roads, the caravans were forbidden to pass through Tehera, the residence of the Shah, on the recommendation of Dr. Martinengo. This capital remained free from 1821 to 1829; after which it was attacked, owing to a neglect of the means which had hitherto preserved it.

* Becker's Letter, p. 9—11.

In November, 1822, when the Cholera prevailed at Aleppo, M. de Lesseps, the French consul, took refuge, with all the Franks who chose to accompany him, in a garden surrounded by a wall and moat, and situated in the vicinity of the town. He remained there during the whole irruption. Two doors only were kept open, the one for ingress and the other for egress. Although the number of persons thus sequestered consisted of about 200, and notwithstanding the variety of their constitutions, habits, and manners, not one was attacked by the Cholera, which raged all around them.

At the end of June, 1823, when this pestilence was decimating the population of Lattaquia, and the neighbouring villages, M. Guys, consul at Tripoli, shut himself up in the same manner, in his garden; all the other Europeans followed his example; and, by using the same precautions as are employed against the plague, every one of them escaped. The use of only the same means was sufficient to preserve the Franks inhabiting other maritime towns of Syria, although they dwelt in the midst of the ravages of the disease, and experienced the same conditions of climate as those that were attacked;—with the difference, however, that they had no communication with infected persons.

In 1819, when the Cholera was ravaging the Mauritius, the houses of M. de Chozal, and of many others, did not experience any attack; their proprietors having prescribed to all the inhabitants the most rigorous sequestration, and this measure being strictly enforced.

In 1820, while an irruption of the Cholera in the town of Manilla was destroying 15,000 inhabitants in the course of fifteen days, the captains of the dif-

ferent vessels riding in the harbour, persuaded that the disease was propagated by contagion, interdicted their crews from intercourse with the land, and thus preserved them from the disease. The Governor of Cavitá adopted the same measure, and the population all escaped.

In 1818, when the island of Bombay was invaded by the disease, many villages, which, from the prejudices of caste and of sects, remained isolated from the rest of the population, escaped during four months, while the others experienced the most terrible mortality.

During the irruption in 1818, at Ellore, the détenus, inclosed in a prison surrounded by very high walls, escaped from the Cholera, which raged all around them.

In 1830, during the extensive irruption of the Cholera in the provinces of the Russian empire, the authorities of the little town of Sarepta, situated on the Volga, 100 leagues from Astrachan, interdicted all communication with the barks which came from that town, where the disease committed dreadful ravages, and the inhabitants all escaped; while the towns situated upon the Volga, both above and below Sarepta, were infected by the disease, and lost a part of their population.*

Many gardens and farms escaped the disease by cutting off all communication with Astrachan: this was also the case with all the villages which adopted similar precautions; as, for example, those on the estates of Smirnow, Beketow, and Prince Dolgorucki.

The crews of vessels, and the troops on board,

* See M. de Jonnés.

have never experienced an attack till they had communication with the shore.*

We shall conclude this division of our work, with the following narrative of facts supplied by Drs. Russel and Barry, and printed in the Papers relative to the Spasmodic Cholera, by order of the Privy Council, pp. 42 and 43:—"In a village of the government of Pensa, where the medical officer was sent in consequence of the breaking out of the Cholera, to trace its origin and to afford medical aid, he learnt the following circumstances, which are attested by all the village authorities, and of which we are promised an authenticated copy, signed by himself. The son of a villager, who was coachman to a nobleman, at fifty versts distance, died of Cholera: the father went to the place to collect the effects of the son, and brought home with him his clothes, which he put on and wore a day or two after his arrival at his native village. He was shortly after seized with Cholera, and died of it: three women who had watched him in sickness and washed his body after death, were also seized and died of the disease: the doctor arrived in time to see the fourth case; and, finding that it spread on that side of the village, he had the common street barricaded on the side where the disease had not reached, and interdicted all communication between the two sides of the village, even for the purpose of going to church. In that side in which the disease first broke out, upwards of 100 cases of Cholera occurred, of whom forty-five died; but the disease did not appear on the other side of the barricade."

All these facts, and many others which it would

* Med. Rep., p. 44.

have been easy to collect, are so totally irreconcilable with the supposition of any condition of atmosphere existing as the cause of Cholera, that we are compelled, in the exercise of a legitimate and rational deduction, to seek for some other and more precise cause; and this we satisfactorily discover in that agent which has been denominated contagion, the laws of whose existence and operation we have seen so faithfully observed in the march and progress of Cholera.

APPENDIX.

GENERAL RESULTS.

THE following "General Results" extracted from the work of M. Moreau de Jonnés, contain so much information respecting the progress, and other attendant circumstances, of Cholera abroad, that we have thought it might not be unacceptable to the English reader to possess a copy of them appended to this Work; especially, as we are not aware that they have before appeared in an English translation.

1. The pestilential disease called Cholera originated in British India, in the Delta of the Ganges, under the 23° of north latitude; and, consequently, from its origin, belongs, like most of the other contagious diseases, to the regions of the tropics and to those alluvial countries bordering upon the mouths of great rivers.

2. Its principal characters are cramps and violent contractions of the extremities, vomiting and purging of a very abundant fluid, acute pains at the epigastrium, and the production of white flakes, which are expelled by vomiting, and deposited from the watery fluid of the stools.

3. These symptoms characterize a disease *sui generis*, similar indeed in many respects to the Cholera morbus of our climate, from which it has taken its name, but essentially differing from it in other characters, especially in the absence of bile, and the power of being transmitted from one person to another, in the same way as other contagious diseases.

4. The irruption, transmission, and propagation of Cholera depend upon circumstances analogous to those which favour or check the importation, developement, and progress of other contagious diseases: these circumstances are not fully known; but it is ascertained that they are not exactly the same as those which regulate the invasion of plague and yellow fever.

5. An elevated temperature is one of the laws determining the existence of Cholera, seeing that the disease originated in the torrid zone, and prevails in temperate countries only in the hottest season. The cold of winter destroys it, or causes it to lie dormant; but the recent example of its prolongation in Russia, in spite of the excessive cold, proves that it can retain its activity in the artificial heat produced by stoves and fur clothing.

6. Humidity of the atmosphere, from the evaporation of seas, rivers, or marshes, is not necessary to the existence of Cholera: its ravages proceed in the midst of the sands of Arabia, or the calcareous and arid plains of Persia, as in the isles of the Indian ocean, or the marshy Deltas of the Ganges, Euphrates, Volga, and Dneiper.

7. The disease is not arrested by elevation of place; and although its activity is diminished when it passes great chains of mountains, it has overrun the Ghauts and the Caucasus; it has spread to a considerable height upon the sides of Mount Ararat and of Himalaya; and its symptoms have not been less violent in the higher regions of the air, than in the maritime towns which lie almost on the level of the ocean.

8. Locality does not appear to exercise any power over its importation and developement, since, after having traversed seas with the ships of commerce, and deserts with the caravans, it breaks out with un-

mitigated fury ; it displays the same symptoms in the isles of the Indian seas and at the foot of the mountains of Himalaya, in the sandy plains of Yémen, upon the basaltic summits of the Isle of France and of Bourbon, in the steppes of Tartary, and upon the banks of the Euphrates, Tigris, or Burrampooter, as upon the borders of Orantes and Cydnus.

9. It attacks indiscriminately the different races of mankind ; and for fifteen years it has affected, by turns, or simultaneously, the Indian, the Negro, the Tartar, the Persian, the Chinese, the Turk, the Jew, the Burmese, the Slavonian, the Spaniard, and the Englishman.

10. It seizes upon its victims in all ranks, and destroys with equal certainty the Nabob, the Brahmin, and the Pariah, the Planter and his Slaves, the General and his Soldiers, the Magistrate and the Beggar. It has penetrated into the palaces of the Governors of India, into the hut of the Negro and of the Indian, into the harem of the Prince Royal of Persia, into the bazaars, the pagodas, the barracks, the monasteries, the English, Russian, Polish, Turkish, Burmese, and Persian camps ; and has travelled with the barks, junks, prames, the merchant-ships, and vessels of the line.

11. The individual predispositions favourable to the invasion of the Cholera, are, as in the other pestilential diseases, all those things which, in the regimen, age, sex, habits, and constitution, favour the absorption of the contagious principle, and the exercise of its deadly action.

12. The circumstances of its prodigious extension are altogether irreconcilable with the idea of a local infection, or of an epidemic influence existing in the atmosphere. On the contrary, they prove that the Cholera is transmitted by communication with per-

sons who have received the contagion, and by the contact of those things which harbour it. They prove that it is propagated exclusively in those places where these circumstances exist; that, to protect individuals, it is only necessary to sequestrate them, even in places surrounded with persons suffering from the disease; and that, to protect a town, it is only necessary to cut off all communication with infected places.

13. These negative facts prove to certainty, that the mode of transmission of Cholera does not essentially differ from that of the Plague and Yellow-fever; and that, since it spreads itself like those diseases, by contagion, the same sanitary measures which arrest the propagation of them, will also arrest the propagation of this.

14. We are altogether ignorant in which of the secretions the contagion exists, and by what means it is transmitted from the sick to the healthy; but, if we except the contagions whose virus consists in a concrete matter, as the hydrophobic saliva, the vaccine lymph, the varioloid pustule, we still know but imperfectly how a great number of the most common contagions are caught; and, for example, it still remains in great obscurity how the itch is propagated.

15. The curative measures which we oppose to its invasion, for the purpose of arresting its deadly effects, are prodigiously multiplied; but they are empirical, uncertain, and most frequently inefficacious. On the contrary, we constantly obtain the most happy success from those sanitary precautions which prevent the irruption of it, or which stop its progress.

16. The mortality from Cholera varies much, according to seasons and places, without our being able to discover the cause, since its principle every where preserves the same virulence, and sometimes kills in

less than two hours the persons whom it attacks, even in those places where its ravages are very confined. It seldom destroys less than a third of those attacked by it; generally more than a half; and too often three-fifths, two-thirds, or even six-sevenths.

17. The pestilential Cholera is not, like the small-pox in our climate, a sort of domestic contagion, the victims of which are seized in the privacy of their fire-sides: it is a great public calamity, leagued to all the social transactions of life, and which spreads terror and consternation through all the people. At its approach, the ships set sail in confusion; armies run away in disorder, as if they had sustained a defeat; sovereigns escape from their palaces; and the whole population abandon the towns and villages, and take refuge in the mountains, or in the woods. Its very name, throughout the East, acts like a dreadful talisman, and causes to be deserted the harems of princes, the bazaars of merchants, and the pagodas of Brahmins. Its power extends over political and military events: it has forced the Persians to raise the siege of Erzeroum, and to make peace with the Ottomans; it has pursued the British armies in the war against Holkar, and in the campaigns against the Burmese; the terror that it inspires has driven away from the temple of Jugger-naut twelve hundred thousand pilgrims, which number, heretofore, repaired thither every year, but the concourse of devotees is now so inconsiderable, that they are not sufficient to drag the colossal chariot of the Idols. The mortality produced by its irruption in the Moluccas and in Java has so diminished the product of these rich colonies, that their expenses, at this moment, exceed their returns; its ravages in China have caused a ruinous diminution in the commerce

of the Russians at the great market of Kiatchta; and these are the things, which, by disorganizing, in the last year, the provinces of the Russian empire, have prepared the way for the reverses of its armies, and the exhaustion of its treasures.

18. The rapidity of the progress of Cholera is much greater than that of any other contagion of which the memory is retained by man. In its march from town to town, it has traversed, in less than a year, the Indian peninsula, which, between the bays of Bengal and Camboge, is 450 leagues broad; and it has only required nine months to extend itself, from south to north, from Ganjam to Cape-Comorin, 300 leagues from the point of its departure. In less than two years it has over-run a travelling line of 400 leagues, which has conducted it from the extremity of the Persian Gulf to the borders of the Mediterranean.

From one year to another, it has traversed, from south to north, the kingdom of Persia, from the Gulf of Ormus as far as the Caucasus, comprehending a space of more than 300 leagues.

In two years and a half, it has invaded China, from Canton to Peking, pursuing a line from south to north, of which the length exceeds 400 leagues.

In six months it has advanced across the Russian empire, from the Caspian provinces beyond the Caucasus as far as the Governments of Twer and Jarslow, which are neighbouring Baltic provinces, a distance of 700 leagues from the point of its departure.

19. It has been transported across seas, from one country to another, by means of the ships of war, and the merchant-vessels; viz., from Calcutta in Bengal, to Malacca in the peninsula of that name, a distance, by sea, of 500 leagues;—from the same town to the isle of Banka, 600 leagues; to Java and

to Borneo, 800 leagues; to Manilla of the Philippines, and to Amboyna of the Moluccas, 1200 leagues; to Macao and to Canton in China, 1300 leagues; and to the Isles of France and Bourbon, under the tropic of Capricorn, more than 1500 leagues from the point of its departure.

From Bombay to Mascat in Arabia, 340 leagues across the Gulf of the Sindus or the Guzarat; to Ormus and to Bender-Abouschir at the mouth of the Persian Gulf, 800 leagues; to Bahrein, upon the Arabian coast of the Gulf, 950 leagues; and to Bus-sorah, 1000 leagues from Bombay.

From the Persian coast of the Mazanderan, across the Caspian Sea, to Astrachan at the mouths of the Volga, on the north-west coast of that sea, a distance of 220 leagues.

From Taganrog or Azof, at the eastern extremity of the inland sea of that name, to Sebastopol in the Crimea, 250 leagues; to Kerson and Odessa, upon the Black Sea, 360 leagues; and to the mouths of the Danube, 400 leagues from the point of its departure.

20. It has penetrated into the interior of continents by the commercial communications following the courses of great rivers; viz., by the Ganges, in the interior of Indostan, to 400 leagues from the mouth of that river; by the Irraouaddy, to 150 leagues within the Birman empire; by the Menan, into the kingdom of Siam; by the vast system of inland navigation carried on in the Chinese empire, in a line more than 400 leagues in length, across the kingdom.

By the Euphrates and the Tigris, into the interior of Mesopotamia, to more than 100 leagues from the mouths of these rivers. Lastly, by the Volga, into the interior of the Russian empire, to 550 leagues

from the shore of the Caspian Sea, where that river discharges its waters.

21. It has crossed with travellers, troops, and caravans, the Ghauts and the Caucasus, which are among the number of the highest chains of mountains in our hemisphere; and it has risen to a great height upon the sides of Himalaya and of Mount Ararat.

22. From the Delta of the Ganges, the place of its origin, in 1817, it advanced eastward as far as the Moluccas, a distance of 900 leagues in a direct line. In 1823, its progress westward had conducted it to the shores of the Mediterranean, in Syria, 1100 leagues from the point of its departure. It then encompassed, after five years of slaughter, an extent of the Asiatic regions, of which the extreme limits, from east to west, are 2000 leagues. It had carried on its ravages from the northern frontier of China, to the isles of the African sea; which gave it a circle, from north to south, of 1600 or 1700 leagues.

23. In the irruption of 1830, in Russia, it advanced 15° of latitude, or 375 leagues towards the polar regions, and 22° of longitude, west of the Caspian, making under the 50° latitude, (eleven leagues to each degree,) about 242 leagues. Whence it follows, that in fourteen years, the Cholera has extended itself in a circle containing, from north to south, 2250 leagues, and more than 2000 east and west.

24. In Indostan it has over-run,

	Square Leagues.
In the Bengal Presidency	43,000
In the Madras ditto	20,000
In the Bombay ditto, and its de- } pendencies	3,000
In the newly re-united countries . . .	8,000
In the whole of British India	74,000

In Russia, in the year 1830, it propagated itself in twenty-nine governments, the surface of which contains 128,000 square leagues, or four times and a half the extent of France.

25. The progress of Cholera, in the immense circle which it has over-run in fifteen years, has taken place in a series of murderous irruptions, of which the number known has been as follows, from 1817 to 1830 :—

200 in the towns of Bengal.

178 in those of the Madras Presidency.

55 in those of the Bombay ditto.

433 in British India.

51 in the Indian Archipelago, and Eastern Asia.

26 in Arabia and Persia.

29 in Mesopotamia and Syria.

117 in the Russian Empire.

656 in the principal towns of those regions.

26. The number of these irruptions has varied considerably each year. We reckon the following :—

In 1817 . . . 32	In 1824 . . . 19
1818 . . . 140	1825 . . . 24
1819 . . . 64	1826 . . . 5
1820 . . . 42	1827 . . . 19
1821 . . . 64	1828 . . . 12
1822 . . . 43	1829 . . . 13
1823 . . . 48	1830 . . . 131

Total 656

Notwithstanding the numerous researches which have furnished us with these numbers, we incline to

believe that they are probably more than half below the truth, and that the Cholera has ravaged, in the course of the last fourteen years, more than 1300 towns in the countries of Asia and Europe.

27. The mortality which it has caused has been estimated, approximately, in each of these different irruptions :

In Indostan, at a sixth of the whole population.

In Arabia, at a third of the inhabitants of the towns.

In Persia, at a sixth ditto.

In Mesopotamia, at a fourth or third.

In Armenia, at a fifth.

In Syria, at a tenth.

In Russia, at a twentieth of the population of the infected provinces.

But, as in Indostan the disease has re-commenced its attacks fourteen times, we cannot estimate the number of its victims, in this region of Asia, at less than eighteen millions of men; and, probably, from 1817 to 1830, there have fallen by it, from Pekin to Warsaw, two or three times as many.

28. We do not find, in history, any pestilence to be compared with the Cholera in the extent and duration of its ravages, except the Black Plague, which passed from Asia into Europe in the fourteenth century, and penetrated into France in 1348. It carried off, in sixteen years, four-fifths of the inhabitants of Europe.

29. The Cholera propagating itself by communication or intercourse, its extension ought to be proportional to their extent and rapidity; and, consequently, its deadly activity ought to increase according

as it attacks civilized countries, where the relations between men are accelerated and increased with the progress of the social state. But, supposing that the contagion advances across western Europe with only the same celerity which it had in Russia in 1830, that is to say, taking twenty days to pass over a space of 100 leagues, it may arrive at Berlin in twenty days; at Buda, Prague, Dresden, and Vienna, in twenty-five days; and penetrate in a month and a half as far as the banks of the Rhine.

30. We cannot doubt that its propagation is favoured by the operations of the active and fierce war which exists between the Russians and the Poles; and that the multiplication of its germs, their development, and fatal effects, are much increased in extent and rapidity, by the concentration of armies, by their marches across infected countries, by the accumulation of men in the hospitals, in the casemates of strong places, in the camp-barracks, by the cast-off clothes of the dead, the intercourse with the prisoners, the fatigues, privations, and a multitude of other circumstances which disseminate contagion, or predispose to its reception.

31. The circumstances which concur with the Cholera to diffuse it are, without doubt, extremely numerous; nevertheless their number is much diminished by the conditions of its propagation, which make the chances of being attacked by it to vary according to persons, times, and places. These chances are less perilous to women than to men; they are less numerous during cold than during great heat; and their danger seems so much the less great as the population is scanty and much scattered. But they attain a frightful pitch when the disease develops itself during summer, among large bodies of troops, or

amongst the inhabitants of a populous town. Under such circumstances, an army may be destroyed, or a capital depopulated, by a single irruption.

32. It must be observed, nevertheless, that as Cholera is not contracted except by communication or intercourse, which is not beyond human foresight to prevent, restrain, or hinder, this pestilence is less formidable than if it was caused by a deleterious principle existing in the mass of the atmosphere; for then, instead of attacking only persons exposed to its action by their intercourse with those already suffering from it, it would seize indiscriminately the whole population, and nobody could escape from its pernicious effects.

33. But such are, in the civilized countries of Europe, the denseness of the population in the country, and the concentration of that in the cities, the prodigious activity of the social '*movement*,' the multiplicity of communications between individuals, families, and nations, that if the Cholera, passing the Vistula and the Carpathian mountains, penetrates into Prussia and the Austrian empire, we can hardly hope that the rest of Europe will escape from its ravages; and it is to be feared that this pestilence, like the invasion of the barbarians of the middle ages, may come to decimate the people, disorganize society, annihilate commerce, and to cause civilization itself to retrograde.

May these terrible calamities be turned away by Providence, or prevented and arrested by the efforts of science, the wisdom of governments, and the co-operation, so necessary and desirable, of all the people!

